



F. No: 126282/Rect./Non-Faculty/2023

Dated: 20/06/2023

NOTICE

**SCHEME OF EXAMINATION AND INDICATIVE SYLLABUS FOR VARIOUS NON-FACULTY POSTS
ADVERTISED BY AIIMS PATNA**

Reference : Advertisement No. F-126282/Rect./Non-Faculty/2023, dated- 26/04/2023, uploaded on the official website of AIIMS Patna www.aiimspatna.edu.in on 26/04/2023 for filling up of various Group 'A', 'B' and 'C' Non-faculty posts at AIIMS Patna.

Important Note:

- The candidates are advised to download their Admit Cards from the website of AIIMS Patna i.e. www.aiimspatna.edu.in. Only website generated Admit Card will be treated authentic and permissible to appear in the said Examination. No admit card will be sent by Speed Post.
- As per practice, the Online Computer Based Test (CBT) for the advertised posts will be conducted without pre-examination screening of the applications of the candidates with regard to their eligibility. Hence, the candidate will be allowed **PROVISIONALLY** to appear in the online (CBT) Recruitment Examination.
- However, the original documents of all selected candidates related to fulfilment of eligibility criteria, experience etc. will be verified by the Institute before final appointment.
- The city for examination will be allocated on the basis of order of application form, candidates choices and availability of computer nodes. Decision of AIIMS Patna in this regard will be final and no further correspondence will be entertained in this regard.
- All applicants are required to visit the website regularly as all subsequent Corrigendum/Addendum/ Updates will only be uploaded on the official website of AIIMS Patna.
- Resolution of Tie Cases : In cases where more than one candidate secures equal MARKS, tie will be resolved :
 - (i) Accuracy in Skill Test (if applicable), otherwise
 - (ii) Date of birth shall be used [candidates who are older / born earlier will be placed above candidates who are younger / born later].
- Medium of Examination : Hindi/English
- 01 mark will be awarded for each correct answer and there will be negative marking of 0.25 marks for each wrong answer.
- CBT by multiple choice questions and Typing & Stenography Test (wherever applicable) will be conducted on the same day.
 - For Hindi Typing Test- Remington Gail Keyboard will be used. Mangal Font is used for typing test.
- **For the post of Assistant Security Officer and Security-cum-Fire Jamadar:**

There will be a separate Physical Eligibility Test (PET) with physical eligibility parameters followed by Medical Examination by AIIMS Patna as mentioned in the advertisement. Selection is subjected to fulfilling the minimum physical eligibility criteria of provisionally shortlisted candidates as per merit list of CBT.
- Indicative Syllabus of CBT Examination for all the posts advertised is **annexed** below.

SYLLABUS FOR ACCOUNTS OFFICER

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (70 Marks):

1. Finance Accounting, Economics & Governance:

Finance & Accounts: Fundamental Principles and Basic Concept of Accounting.

Financial Accounting: Nature and Scope, Limitations of Financial Accounting, Basic Concepts and Conventions and Accepted Principles.

Basic concepts of accounting: Single and double entry, Bank Reconciliation, Books of Original Entry, Trial Balance, Ledgers, Journal, Trading, Rectification of Errors, Manufacturing, Profit and Loss Appropriation Accounts, Balance Sheet Distinction between Capital & Revenue Expenditure, Valuation of Inventories, Depreciation Accounting, Non-profit Organizations Accounts, Receipts and Payments and Income & Expenditure Accounts, Bills of Exchange and Self-Balancing Ledgers.

2. Business Law, Fundamentals of Capital Budgeting, Financial Analysis, Planning and Control, General Financial Rules 2017, Government Procurement Process, GeM e-tendering, GST etc.

SYLLABUS FOR ANTENATAL MEDICAL OFFICER

Subject Knowledge of Basic Medical Science (70 Marks):

Anatomy, Bio-Chemistry, Physiology, Pharmacology, Microbiology, Pathology, Forensic Medicine and Toxicology, Ophthalmology, ENT, Community Medicine, Surgery, Orthopaedics, Medicine, Paediatrics, Obstetrics and Gynaecology

Subject Knowledge of Specialty subject (30 Marks):

1. Anatomy of female reproductive system, bony pelvis and skull
 2. Physiology of pregnancy & labor
 3. Contraception
 4. Infertility & IVF
 5. Prenatal screening and fetal therapy
 6. Obstetric and gynaecological ultrasound and other imaging
 7. Cesarean section, operative vaginal delivery
 8. Puerperium and new born
 9. Antepartum obstetric complication –
 - Miscarriage,
 - Ectopic,
 - Intrauterine fetal death,
 - Premature rupture of membrane
 - Intrauterine growth retardation
 - Multifetal Pregnancy
 - Antepartum Hemorrhage
 - Rh Negative Pregnancy
 10. Intrapartum complication
 - Malposition
 - Malpresentation
 - Obstructed labor and uterine rupture
 - Complication of 3rd stage of labor
 - Shock
 11. Maternal disease in pregnancy
 - Hypertensive disorder, diabetes, liver hematological, cardiovascular endocrine, thyroid, thromboembolic disorder
 12. Benign and malignant lesion of ovary, cervix endometrium, vulva vagina.
 13. AUB, fibroid, adenomyosis
 14. Prolapse uterus
 15. Infection of genital track
 16. Menopause and HRT
 17. Urogynecology
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SYLLABUS FOR THE POST OF ASSISTANT ADMINISTRATIVE OFFICER

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Central Govt. Service Rules (80 Marks):

Central Government Rules: Questions relating to CCS (Leave) Rule, CCS (Conduct) Rules, GFR, FR/SR, General Service Condition, Office Procedures, Types of correspondence, General Knowledge about IPC/CRPC, CPC/CAT/High Court, RTI Act, 2005, Establishment, Reservation, Roster, LTC, Travelling Allowance etc.

SYLLABUS FOR THE POST OF ASSISTANT ENGINEER (AC & R)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (70 Marks):

- General —
Knowledge of Indian Electricity Act, Indian Elect. Rules as amended up-to date. General conditions of supply and charges to be paid to licences for obtaining connection. CPWD General Specifications for Electrical Works, Principles of analysis of rates. General Principles

in preparation of estimates, project reports, award of works and execution of works and measurement. ISI/BIS Standards and Codes of practices.

Internal Electrical Installations - Systems of wiring and their design, distribution system. Apparatus for Control, protection and Testing.

- Earthing, Lighting Protection, Safety & Maintenance - Necessity of earthing, earthing resistance, type of earthing. Lighting protection design, layout, material and installation. Safety procedures and practices, principles of equipment installation, preventive maintenance and testing of equipment.
- Sub-Station upto 33 KV and Distribution - Layout and Design for indoor and outdoor application. Specification for equipment, Sub- Station earthings, stand-by generating sets, commissioning procedures and tests.
- Distribution: Design of overhead line and underground distribution systems. Specification for cables, conductors, Supports etc. Cable joining and termination methods, power factor improvement, service connection to buildings. Air-Conditioning Ventilation - General principles of Refrigeration, Air- Conditioning, evaporative cooling and ventilation, Heating and cooling load estimation. Classification of systems, their design and application, structural requirements, specifications for installations.
- Water Supply - Types of pumps and their characteristics. Prime movers, pumping systems and application. Specification for equipment and installation.

ELECTRICAL APPARATUS —

- Single and poly phase A.C. Circuit. Effects of resistance inductance and capacitance.
- Single and poly phase transformers — constructional features, equivalent circuits performance, parallel operation, phase conversion. Separation of losses and determination of efficiency by various methods. Auto transformers.
- Alternators, Constructional features, regulation, parallel operation and Protection. Automatic Voltage regulators, Emergency generating sets, automatic change over.
- Induction machines, polyphaser motor and its principle of operation and equivalent circuit. Torque, slip characteristics. Crawling, methods of starting, single phase motor, its theory, characteristics and application.

INSTRUMENT TRANSFORMERS, PROTECTIVE RELAYING, MEASUREMENTS- Current, Voltage transformers. Constructional features of IDMT relays, instantaneous relays including knowledge of overload earth fault, undervoltage, Bucholz relays. Connection diagrams, settings. Electrical instruments and Measurements, principles of construction and theory of measuring instruments for direct and alternating currents. Commercial types. Measurement of resistance, Voltage, Current, power, power factor and energy. Watt meters, energy meters. Thermo couples, Resistance Thermometers, Pyro-meters. Fault locating bridges for cables. Measurements of resistance, inductance and capacitance, wheatstone bridge.

INTERNAL COMBUSTION ENGINES-

- Fuels and Combustion. Fuels and their properties, combustion calculations. Analysis of products of combustion. Power cycles. Vapour power cycles-Carnot and Rankine. Gas Power-Otto and Diesel cycles. Deviation of actual cycles from theoretical cycles. Internal combustion engines — Two and four stroke compression ignition and spark ignition engines. Combustion Phenomena, Detonation, Knocking, scavenging of two stroke engines. Fuel injection and carburation. Lubrication and cooling system performance and testing of IC engines. Pollution control requirements/standards.
- HEATING, AIR CONDITIONING AND REFRIGERATION- Refrigeration — Refrigeration and heat pump cycles. Vapour compression, absorption Cycles. Refrigerants and their characteristics. Air Conditioning — Psychrometric chart, comfort air conditioning, comfort indices, ventilation requirements. Cooling and dehumidification methods. Industrial air-conditioning processes. Different methods of electric heating. Construction and performance of Electric heating equipment.

- WORKSHOP TECHNOLOGY- Estimation of power and energy requirements of electric welding, different types of equipments used and their characteristics. Manufacturing and Fabricating methods and practices for various electrical and mechanical equipment such as pumps, switch boards, light fittings, AHUs etc.

ENERGY CONSERVATION, POWER FACTOR IMPROVEMENT

- Comparison of different types of lamps from the point of energy conservation, calculation of pay back period. Power factor improvement, Reduction of load current and transformer losses due to power factor improvements. KVA requirement for power factor improvement.

SOLAR ENERGY UTILISATION-

- Solar Hot Water system, principles, constructional features, constituent parts, installation, operation & maintenance, solar photo voltaic system, Advantages/disadvantages of solar heating & solar photo voltaic system.

SYLLABUS FOR THE POST OF ASSISTANT ENGINEER (CIVIL)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (70 Marks):

- Fundamentals of Civil Engineering
- Subject Knowledge of Civil Engineering: Strength of Material and Theory of Structures Stress Strain relation - Hooke's Law, Determination of forces in members of trusses pin-jointed frames, Bending Moments and shear forces. Theory of simple bending, Continuous beams and simple portals -Determination of bending moments and shear forces - methods of analysis.
- Design Principles Determinations of dead, live and wind, seismic loads - Relevant I.S. Codes, Factor of Safety and Load Factor.
- Steel Design, Design of simple Beams and plate Girders according to Indian Standards, Design of single and built-up columns, column base connections, Design of Steel Roof Trusses.
- Reinforced Concrete - Basic principles of reinforced concrete, shear, bond and diagonal tension, location of reinforcement, Design of singly and doubly reinforced beams, one way and two way slabs, Theory and design of reinforced concrete columns with uni-directional bending only, Design of cantilever and simple counterfort retaining wall, Liquid retaining structures - Special requirements.
- Construction Practice - General details of Building construction including foundations, flooring, masonry and different type of roofs. Safety during construction, durability. General properties, standard requirements and tests for common building material such as bricks, stones, sand and aggregate, cement, lime, timber and steel. Tests for fresh and hardened concrete.
- Central PWD Specifications for building works, sanitary and water supply works and road works including modes of measurements.
- Surveying - Use and adjustment of Surveying Instruments: Chain, Plane table and accessories magnetic compass, level and theodolite. Use of Compass and Theodolite: Alignments and adjustments. Levelling Methods of leveling and reduced level calculations. Contour Survey: Methods of contouring, properties of contours, Curves and alignment: Setting out of simple, reverse and transition curves using different methods, Vertical curves.
- Highway Engineering Road alignment in hills and plains, minimum standards for National highways. Principles of design of urban roads, their cross-sectional requirements and interactions, road drainage and maintenance. House paths, approach roads and service lanes.
- Public Health Engineering Water Supply: Quality and quantity of water required for public water supplies. Water purification processes. Water distribution systems - valves and fittings - testing. Sanitation: Orientation, ventilation and damp proofing of buildings. Sanitary appliances Construction and testing of house drains.
- Sewage disposal - Sewerage system: - Construction and maintenance. Types of sewage treatment - Oxidation ponds - simple sedimentation, re-circulation and filtration - plant, contact beds - percolating filters. Septic tanks.
- Soil Mechanics and Foundation Engineering: Properties of soils, classification, soil explorations, methods of determining bearing capacity.
- Foundation Engineering: Principles of selection of type of foundation for a structure, shallow and deep foundations. Compaction; Laboratory and field methods, optimum moisture content, soil stabilization

SYLLABUS FOR THE POST OF ASSISTANT ENGINEER (ELECTRICAL)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (70 Marks):

- Fundamentals of Electrical Engineering
- D.C. Circuits: Units and dimensions, Ohm's Law, Kirchhoff's Law, Superposition theorem, Thevenin's theorem and their application for analysis of series and parallel resistive circuits excited by independent voltage sources, Power & Energy in such circuits. Mesh & nodal analysis, Star Delta circuits.
- Single phase AC Circuits: Generation of sinusoidal AC voltage, definition of average value, R.M.S. value, form factor and peak factor of AC quantity, Concept of phasor, Concept of Power factor, Concept of impedance and admittance, Active, reactive and apparent power, analysis of R-L, R-C, R-L-C series & parallel circuit
- Three phase AC Circuits: Necessity and advantages of three phase systems, Meaning of Phase sequence, balanced and unbalanced supply and loads. Relationship between line and phase values for balanced star and delta connections. Power in balanced & unbalanced three-phase system and their measurements
- Magnetic Circuits: Basic definitions, magnetization characteristics of Ferro magnetic materials, self-inductance and mutual inductance, energy in linear magnetic systems, coils connected in series, AC excitation in magnetic circuits, magnetic field produced by current carrying conductor, Force on a current carrying conductor. Induced voltage, laws of electromagnetic Induction, direction of induced E.M.F. single phase transformer- general construction, working principle, c.m.f. equation, open circuit and short circuit test
- Electrical Machines: D.C. Motor & D.C. Generator, Three phase Induction motor and Synchronous Machines, their general construction, working principle, e.m.f equation and applications. Types of losses occurring in electrical machines.
- Electrical Measurements and Instrumentation
- Introduction, History and Overview of measurement system, Fundamental of Measurement system, static and Dynamic Characteristics, Error analysis, Loading effects, calibration of instruments. Galvanometers — Theory & operation of ballistic galvanometer, D'Arsonval galvanometer, galvanometer motion & damping, Sensitivity, Flux meter, Vibration galvanometer, Spot deflection galvanometer. Definition of analog & digital instruments, Classification of analog instruments, their operating principle, Operating force, Types of supports, Damping, Controlling.
- Different types of Ammeter & Voltmeter — PMMC, MI, Electrodynamic, Hotwire, Electrostatic, Induction, Rectifier, Ferro dynamic & Electro-thermic, Expression for control & deflection torque, their advantages, disadvantages & error, Extension of range of instruments using shunt & multiplier, Ohmmeter — series & shunt type, Multi-meter.
- Measurement of power: Power in AC and DC Circuit, Electrodynamic type of wattmeter, Construction, theory, operation & error, Low power factor & UPF wattmeter, Double element and three element dynamometer wattmeter, Measurement of power in three phase circuit, one, two & three wattmeter method, Measurement of reactive power by single wattmeter
- Electronic Energy meter— Single Phase and Three Phase, Testing by Phantom Loading, Trivector meter— Maximum demand meter, Power Analyser, Power factor meter. Instrument transformers: Potential and current transformers, ratio and phase angle errors, testing of instrument transformers, Difference between CT and PT, errors and reduction of errors, Measurement of power using CTs & PTs.
- Miscellaneous Instruments & Measurements:- Frequency meter — Vibrating reed, Resonance type & Weston type, Synchronoscope, IR Tester & Ratio meter. Resistance Measurement — Classification of low, medium & high resistance —Wheatstone Bridge, Kelvin's double bridge & loss of charge methods for resistance measurement, Earth resistance measurement. Magnetic Measurement — B-H Curve, Hysteresis Loop determination, Power loss in sheet metal — Lloyd Fischer square for measurement of power loss.

SYLLABUS FOR ASSISTANT LAUNDRY SUPERVISOR

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

- On and Off Premise Laundry, advantages and disadvantages
 - Flow process chart in laundry
 - Stages in the laundry process
 - Laundry equipment
 - Location, layout and planning of laundry
 - Stain removal: agents and method
 - Alternative laundry procedures
 - Disinfection
 - Blood and Human Secretion related infection
-

SYLLABUS FOR THE POST OF ASSISTANT SECURITY OFFICER

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

- **Law :** The Constitution Of India, Indian Penal Code, Code of Criminal Procedure, Juvenile Justice Act, Bihar Medical Service Institution and Person Protection Act 2011, The Arms Act, Right to Information Act, The Private Security Agency Regulation Act 2005, Information Technology Act
- **Physical Security:** Physical barriers, Security lighting, Watch towers
- **Intrusion detection and Electronic surveillance:** Intrusion detection sensors, CCTV camera surveillance system
- **Personnel Access Control:** Public Access control, Bio-metric access control system, Key & lock control system, Door Frame Metal Detector, Hand Held Metal Detector

- **Material Access Control:** Movement of material, Gate Pass, X-ray baggage scanners
- **Vehicle Access Control:** Boom barriers and its operation, Under Vehicle Scanners, Road Blockers
- **Security Agency:** Role of Private Security Agencies in providing security to Institutions
- **Fire Safety:** Fire prevention and detection
- **Communication Skill:** Functions of Communication, Communication process, Direction of communication, Interpersonal communication, Organizational communication & Electronic communication
- **Conflict and Negotiation Management:** Definition of conflict, Transition in conflict thought, Conflict process, Definition of negotiation, Bargaining strategies, Negotiation process, Individual differences in negotiation effectiveness & Third party negotiation

SYLLABUS FOR THE POST OF CASHIER

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language & Comprehension(10 Marks):

Candidates' ability to understand correct English, his basic comprehension and writing ability, etc. would be tested.

E. Basic Computers (10 Marks)::

- a) General Computer Processing ability in MS-Office like Word Processing, Excel, PowerPoint etc. & Operating Systems.
- b) Professional Software/Hardware System relevant to the Post.
- c) Any other Computer/IT related questions.

F. Fundamental Principles and Basic Concepts of Accounting (80 Marks):

Financial Accounting - Nature and scope, Limitations of Financial Accounting, Basic Concepts and Conventions, Generally Accepted Principles. Basic Concepts of Accounting: Single and Double Entry System, Books of Original Entry, Bank Reconciliation, Journal, Ledgers, Trial Balance, Rectification of Errors, Manufacturing, Trading, Profit & Loss Appropriation Accounts, Balance Sheet, Distinction between Capital and Revenue Expenditure, Depreciation Accounting, Valuation of Inventories, Non-profit making organizations' Accounts, Receipts and Payments, Income & Expenditure Accounts, Bills of Exchange, Self-Balancing Ledgers.

SYLLABUS FOR THE POST OF CODING CLERK

PART-I

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage, Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Basic Computer Knowledge (10 Marks):

General Computer Processing ability in MS-Office like Word Processing, Excel, Power Point etc. & Operating Systems.

Professional Software/Hardware System relevant to the Post.

Any other Computer/IT related questions.

F. Subject Knowledge (40 Marks):

- Definition, objectives & functions and classifications of Hospitals.
- Departmental administration, delegation and decentralization.
- Departments and service units.
- Medical Terminology: Elements of medical terms (Roots, prefixes, suffixes, colours, numerals, symbols, abbreviations). Terms related to Investigations, Operations, Treatment of conditions & Disorders.
- Introduction, Values, Purposes and Uses of Medical Records.
- Documentation of Records (indexes/ Registers).
- Birth, Death, Registration and Correction in Record.
- Medical Ethics and Legal Aspects of Medical Records.
- International Classification of Diseases (ICD-10) and Related Health Problems.
- Medical Coding.
- Electronic Medical Record/ Hospital information System.
- Contents and Components of Medical Record.
- Numbering, Filing and Retrieval of Medical Records.
- Retention, Preservation and Destruction of Medical Records.
- Accidents registers and wound certificates Legal aspects of hospital-patient, doctor-patient, hospital doctor relationship.
- Medico-Legal Cases.
- Hospital Statistics.

PART-II

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF CSSD TECHNICIAN

Subject Knowledge (120 Marks):

A. Basic Anatomy (10 Marks):

1. General Introduction– Definition of Anatomy & Physiology. – Types of Anatomy (including systemic) – Definition of topographic term/term used to describe the body.
Description of Various regions of the body.
2. Cells and tissues of body and general histology.
3. Anatomical description of the following:
 - Skin and breast
 - Ontology
 - Joints
 - Ligaments
 - Fasciae and Bursae Musculoskeletal system
 - Cardiovascular system – Respiratory system– Lymphatic system
 - Blood and blood forming organs
 - congenital system
 - Endocrine system
 - Organs of special senses (ear, eye, etc.)
 - Digestive system
 - Embryology

B. Basic Physiology (10 Marks):

Introductory Lectures or specialization of tissues. Homeostasis and its importance in mammals. Blood and lymphatic system, Cardiovascular system, Excretory system, skin and temperature regulation, Respiratory System, Digestive system and metabolism Endocrinology, Reproductive system, Nervous system, Special senses, Muscles

C. Basic Pathology and Microbiology (10 Marks):

Definitions and Classification of diseases,

- Inflammatory diseases – viral and fungal, Parasitic.
- Degenerative diseases – Fatty degeneration, Amyloidetc.
- Tumors – Definition, etiology& classification.

Disturbances in blood flow, pigment disorders, hereditary diseases, C.V.S. Blood vessels, Heart, Respiratory system, G.I. tract, Liver Lymphatic system, genitourinary system, skeletal system, Blood, Central Nervous system, Endocrine system Clinical Pathology – Normal composition of blood; diseases of RBCs, WBCs, Platelets. Coagulation factors and disorders Blood groups and cross – matching, Blood transfusion, in common diseases, CSF and body fluids, Gastric & Duodenal contents, parasites, Introduction and historical background, Classification special, Characteristics of organisms bacteria, Asepsis, Disinfection, Antiseptics, Sanitation, Infection, Immunity, Allergy, Study of pathogenic organisms, Non-pathology organisms, Virus and fungus, Parasitic diseases- their stance in India with lab Diagnosis.

D. Operation Theatre Techniques (10 Marks):

Operation theatre techniques, Surgical Procedures Organize and set up trolleys for theatre Tracking and recall of equipment items, Surgical Instruments, Criteria for Purchase and Maintenance Checking in and out of loan instruments Decontamination Process Scientific Principles Recommended Practices.

E. Disinfection (10 Marks):

Principles of Disinfection Cleaning of equipment, Use of detergents Sonic washers /Mechanical cleaning apparatus^[1]Cleaning of catheters and tubings, cleaning glass ware, cleaning syringes and needles, Preparation and Supplies for Terminal Sterilization.

F. Packaging and assembly line (10 Marks):

Precautions while handling instruments and line, Assembly and packing, Packaging selection and use, Materials used for wrapping and packing assembling pack contents. Types of packs prepared. Inclusion of trays and gallipots in packs. Method of wrapping and making use of indications to show that a pack of container has been through a sterilization process date stamping.

G. Sterilization Methods (10 Marks):

Different Methods of Sterilization, High Temperature Sterilization – Dry Heat Moist heat sterilization, EO gas sterilization, H₂O₂ gas plasma vapor sterilization Endoscopes and their Sterilization Recommended Practices for Flash Sterilization

H. Sterilization record keeping (10 Marks):

Sterile storage, Call back system in case of detection of failure, HVAC system, Records & register maintenance

I. Quality assurance (20 Marks):

Biological indication and quality control Quality measurement methods and its standards

J. Quality Standards (20 Marks):

International Organization for Standardization (ISO) standards Water Quality and its impact in CSSD process biomedical waste disposal protocols.

SYLLABUS FOR THE POST OF DARK ROOM ASSISTANT

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Anatomy and Physiology (10 Marks):

- Structure of the body–cells, tissues. Musculoskeletal System: Skull, Vertebral column, Shoulder Girdle Bones of upper extremities, Bones of lower extremities, pelvis and its muscles, Ossification.
- Cardiovascular System: Heart–blood– Arteries–Veins.
- Lymphatic System: Circulation of Lymph, Lymph glands
- Respiratory System: Nose, Larynx Trachea-Lungs Bony-case.
- Nervous System: Brain-meninges ventricles-Spinal cord and nerves.

- Eye: Structure and its function.
- Ear: Structure and function.
- Surface Anatomy and Cross-sectional Anatomy.
- Reproductive System: Female & Male organs.
- Urinary System: Kidneys, Ureters, Bladder, Prostate and Urethra.
- Skin: Structure and its function.
- Endocrine System: Pituitary gland, Penial gland, Thymus gland, thyroid and parathyroid gland, suprarenal glands

F. Dark Room Techniques (10 Marks):

- Photographic Process: Light image, Image produced by radiation, Light Sensitive materials, latent image.
- Film Material: The structure of X-ray & Imaging films, Resolving power, Grains of films, sensitivity of film, contrast of films, Type of films.
- X-ray Film Storage: Storage of unexposed films.
- Screens: Construction of intensifying screens.
- Choice of fluorescent material.
- Intensification factor, Detail, Sharpness. Speed, Screen contact, care of intensifying screens, Types of Screens. Cassettes: Cassette designs, Care of cassette, mounting of intensifying screen in the cassettes, various types of cassettes.
- Safe Light: Constituents, filter, testing. Film Processing: Constituents of processing solution and replenishes.
- Factors affecting the development. Types of developer and fixer, Factors affecting the use of fixer. Silver recovery methods.
- Film Rising, Washing and
- Drying: Intermediate rinse-washing and drying.
- Film Processing Equipment: Manual and Automatic processing. Dark Room Design: Outlay and materials used.
- Radiographic Image: The sharpness, contrast, detail, definition, viewing conditions & artifacts.
- Miscellaneous: Trimming, identification of films, legends, records filing, report distribution.

G. General Physics (10 Marks):

- Elementary idea of thermionic emission, Electron-idea of mass and nature of charge, Coulomb's law, Electric field, Unit of potential.
- Ohm's law, Units of resistance, potential and current, Earthing of electrical equipment.
- Magnetic fields, Lines of force, Construction and working of galvanometer, voltmeter, A.C. and D.C. currents-effective current, Electromagnetic induction – Laws, fields, influence. Transformers – Principles, construction, and uses of step down and High tension transformers.
- Diode values and their use in rectifiers solid-state rectifiers, its various rectifying circuits uses in X-ray machines, production of X-rays and their properties, X-ray tube-Stationary anode and rotating anode & therapy tubes, X-ray circuit, interlocking circuits, relay and timers.

H. Radiographic Techniques (10 Marks):

- Upper Limb: Fingers individual and as a whole hands, Carpal bones wrists, Forearm, elbow-head of radius, humerus, shoulder joint, Acromioclavicular joint, scapula, sternoclavicular joint, small joints.
- Lower Limb: Toes, foot, calcaneum & other tarsal bones, ankle joint, legs, knees, patella, fibula, femur, intercondylar notch.
- Hip & Pelvis: Hip, Neck of femur, threatre procedure, for hip pinning or reduction, pelvis, sacro-iliac joints, pubic bones, acetabulum.
- Vertebral Column: Curves, postures, relative levels atlanto, occipital region, odontoid process, Cervical spine, thoracic Inlet, Cervico, thoracic spine,

- lumbosacral spine, sacrum, coccygosis, kyphosis, flexion, extension and neutral.
- Bones of the thorax: Sternum ribs. Skull: Land marks, Cranium, facial bones, maxilla, mandible, zygoma, T.M.
- joints, mastoids, petrous bones, optic foramen, sella turcica, P.N.S.
- Chest: Chest in teleradiography, chest supine & portable, Lordotic, apicogram and MMR.
- Abdomen: Preparation, indication and contraindication, acute abdomen, pregnancy abdomen for multiplicity maturity and foetal abnormality.
- Pelvimetry.
- Soft tissue: Neck and breast.
- Emergency Radiography: Bedside radiography, O.T. Radiography.
- Radiography for age evidence: Bone age evidence.
- Dental Radiography: Occlusal view, Dental X-ray, Panoramic view.

I. Radiographic Procedures (10 Marks):

- Contrast media.
- Urinary Tract: I.V.P., Retrograde Pyelography, Cystourethrography. Presacral Insufflation.
- Biliary Tract: Oral cholecystography, I.V.C, Trans hepatic percutaneous cholangiography preoperative cholangiography – T-tube cholangiography, E.R.C.P.
- Tomography: Principle, equipment and types of movements, procedure.
- Venography:
- Mammography and Xeroradiography.
- Female Genital Tract: Hystero Salpingography, Gynecography, Placentography & Pelvimetry.
- Angiography: Carotid angiography, Femoral arteriography, Aortography, Selective angiography etc.
- Sialography
- Sinography
- Arthrography

J. Radiation Physics and related equipments (10 Marks):

- Latent images formation and its processing.
- Various units used for measuring radiation—Roentgen, rad and rem. Construction of X-ray tube, X-rays—its production and properties.
- Ionization chambers, G.M. Counter and Scintillation Counter, Interaction of X-ray with matter.
- Quality and quantity of X-rays, HVT, linear absorption coefficient, Grid, Cones and Filters.
- Inverse square law, scattered radiations and appliances used to reduce it.
- II. Radioactivity
- Curie, Half-life, decay factor. Details about radium, cobalt and caesium.
- Doses—dose and dose rate, exposure dose, exit dose, surface dose, depth dose, isodose charts and their uses.
- Radiation Hazards, Protection against it, film badge, pocket ionization chamber, maximum permissible dose.
- High-tension control equipment – Diagnostic H.T. circuits,
- Production of X-ray tubes and high tension circuits for the production of control panel and control safety device and interlocks, basic principles of mega voltage X-ray machines.
- Fluoroscopy – Tube filtration, diaphragm, tilting couch screen grid and exploratory and control safety devices, compressors, protection, electrical radiographic and mechanical control, use and care of couch accessory fittings. Special equipment – body section radiography, apparatus and controls simultaneous multi section accessories specialized couches, skull table, mobile units. Image intensifiers, principles, optical systems, for viewing and recording final image electrical and x-ray supply protection, applications, including cine radiography, mass miniature radiography, special radiography, equipment for high speed serial techniques (etc.) rapid cassette changer rapid films changer, roll films, full size and miniature, biplane

equipment, grids, protection, problems of processing and presentation, care and maintenance – general principle and routine use of charts supplied by manufactures, radiographic calibration procedure.

- Care of patient: - first contact with patient in the department handling of chair and stretcher patients, lifting of ill and injured patients, elementary hygiene, personal cleanliness, hygiene in relation to patients. E.g. clean linen and receptive nursing care, temperature. First Aid: - Shock, asphyxia, convulsions, artificial respiration, electric shock, burns, scalds,
- Haemorrhage, pressure point, tourniquet, fractures, splints, bandaging, foreign bodies, poisons, drug, reactions, administration of oxygen.
- Preparation of a patient for general X-ray examinations. Departmental instruction to out patients or ward staff, use of aperients, enema and colonic irrigation, flatulence and flatus causes and methods of relief, principles of catheterization and intubations, premeditation, its uses and methods, anaesthetised patients, nursing care before and after special X-ray examinations e.g. in neurological, vascular and respiratory conditions diabetic patients, special attention to food, trauma hazards.
- Preparation of patients for special x-ray examinations barium enema, barium meal, intravenous pyelography cholecystography etc. and their administration.
- Principles and aspects: - Methods of sterilization, care and identification of instruments and surgical dressings in common use, setting of trays and trolleys for various examinations etc.
- Intravenous pyelography, biopsy, elementary operating theatre produce. Drugs in department- storage, labelling checking, regulations regarding
- Contrast media- barium preparations, iodine
- Radiographic Photography:
- Photographic aspects of radiography– the fundamentals of the photographic process, light sensitive salts of silver, the photographic emulsion gelatin as suspension medium, size and frequency of the silver halide grain in relation to sensitivity and contrast, formation of the latent image, chemical development, construction of x-ray film base material, substratum coating, emulsion, coating anti-abrasive super coating sensitivity, storage of unexposed film.
- Characteristics and detail freedom from chemical fog and staining, long life possibility of degeneration.

K. Specialized investigations (10 Marks):

- Computed Tomography
- Principles of CT – Basic Physics
- Recent developments, applications etc.
- Positioning in CT
- Different types of contrast materials.
- Emergency treatment.
- Radiation hazards
- Disposal of unused matter. Magnetic Resonance Imaging Principle – Physics – Techniques
- Types of coils – Basic term used in MRI Operations, Applications, etc.
- Positioning in MRI.
- Different types of contrast materials.
- Emergency treatment.
- MRI hazards.
- Factors affecting quality of imaging. Ultrasound
- Physics – Types of ultrasound – Techniques of ultrasound scanning in different parts – positioning and filming – Principles of Doppler effect and colour Doppler.

SYLLABUS FOR THE POST OF DATA ENTRY OPERATOR GRADE 'A'

PART-I

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (20 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (20 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar- diagram, Pie-chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic Computer Knowledge (20 Marks):

General Computer Processing ability in MS-Office like Word Processing, Excel, Power Point etc. & Operating Systems.

Professional Software/Hardware System relevant to the Post.

Any other Computer/IT related questions.

PART-II

Skill Test:

The Skill Test will be of qualifying nature. Data Entry Speed of 8000 (Eight Thousand) key depressions per hour on Computer will be adjudged on the basis of the correct entry of words/key depressions as per the given passage. The duration of the Test will be 15 (Fifteen) minutes and printed matter in English containing about 2000-2200 key-depressions would be given to each candidate who would enter the same in the Computer. The passage to be entered in the Computer may also be displayed on the Computer screen.

SYLLABUS FOR THE POST OF DEPUTY MEDICAL SUPERINTENDENT

Subject Knowledge (100 Marks)

A. General Management (25 Marks):

- **Management Concepts:** History & growth of management science Evolution of management theory
- **Management functions & tools :** Functions & Principles of management
- **Organization structure and function behavior, group dynamics:** Organization structure, design, behavior, group dynamics, Motivation Leadership. Line & staff authority & delegation, conflict management, Transactional Analysis.
- **Office Procedures & Basics of Computer:** Office Procedure, Service rules & procedures, Conduct rules. Disciplinary proceedings. Official letter drafting. Working knowledge of Computer with word, excel & Power Point.
- **Communication:** Definitions, types, barriers, Principles, Media.
- **Personnel Management & HRD:** Definition, Difference & importance of Personnel & Human Resource development, Work study method study, Manpower Planning, Job descriptions, evaluation, Training performance appraisal.
- **Financial Management:** Costing, Method of Costing, Hospital rate setting, Budgeting, cost containment.
- **Material Management:** Inventory Control, Purchase tender, Inventory analysis, Receipt & inspection of stores, Condemnation & Disposal.
- **Risk Management:** Occupational hazards, Grievance redressal, wage fixation, Trade union.
- **Modern quality Management techniques:** Management by objectives (MBO), quality assurance, NABH, JCI.
- **Marketing Management:** Concept of marketing, strategies evaluation & control.

B. Health Administration & Medical Care (25 Marks):

- **Health Services in India:** Evolution of modern medicine, Review of different reports on health care.
- **Health & Disease:** Concept of health & disease, wellbeing, Natural history of disease, cause & effect relationship, health indicator.
- **National health Policy:** Various health policies of relevance.
- **Epidemiology & Biostatics:** Epidemiological studies & methods, monitoring & surveillance, screening, Investigation of epidemics. Presentation of data, distribution, central tendency, dispersion sampling, testing of Hypothesis significance.
- **Health Statistics:** Incidence & prevalence rates, Morbidity & Mortality Statistics. ICD. Notifiable disease. Health information system in India.
- **Health Care delivery, Health economy:** Health care delivery system in India, Primary, Secondary and tertiary care, Inter sectorial coordination. IEC & Community participation, Health insurance scheme, Ayushman Bharat, CGHS, ESI etc.
- **Populating dynamics & National health Programs:** Demographic cycle and family planning. All National health programs.
- **International Health:** International health agencies & NGOs and regulations.

C. Hospital Administration and Planning (25 Marks):

- **Hospital Administration:** History & development of Hospitals, type control, role & function of Hospitals, role & function of Hospital Administrators.
- **Nursing Administration:** Nursing profession structure, relationship with doctor & patient, staffing norms, recent trends.
- **System approach & human relation in Hospital:** Hospital as a system, Public relation, Training, manpower, interpersonal relationship & conflict.
- **Employee welfare:** Welfare association, stress, counselling occupational safety.
- **Legal issue in Hospitals:** Medical jurisprudence, Medical ethics, various Law & Facts.
- **Hospital Hazards & BMW:** General safety, Fire safety, Hospital hygiene, Hospital acquired infection, Radiation safety, BMW, Bio medical waste, rules.
- **Equipment Management:** Demand estimate, Planning & selection, Purchase procedures, Installation, Commissioning, Repair, maintenance, Quality control, Calibration.
- **Quality in Health services & future of Hospital Administration:** Quality concept, quality assurance, Total quality management, Hospital statistics & quality control, recent trends & challenges to administration, Re-engineering, Telemedicine, Artificial intelligence, Accreditation.

D. Administration of Clinical & Non Clinical Services (25 Marks):

- **Hospital Planning-** General Consideration: Changing system of health services, concepts in planning, designing, site survey, Hospital building, architectural, aspects, internal arrangement, hygiene, lighting, ventilation, role of hospital administrator.
- **Clinical Services areas:** Outpatient department, Operating department, or OT, in patient dept., ward design, ICU, Nuclear medicine dept. , Physical medicine, Burns & Plastic care center, Nephrology including dialysis, department/units, Transplantation unit.
- **Support services:** Radiological & imaging, Laboratory, Blood transfusion, Ambulance, Pharmacy, CSSD, Medical gas pipeline system (MGPS), Dietary & Kitchen, hospital laundry.
- **Utility Services:** Housekeeping, hospital engineering, stores, Medical record department, Hospital establishment & offices, cafeteria services, welfare services, Mortuary.
- **Planning of different types of hospital & projects management:** Planning of 30,100,250,500,750 and above bedded hospital (teaching, super specialty, non-teaching, specialty, general hospital), standards & guidelines. Feasibility study, project concepts, functional requirement, Architect brief, project description, equipment & human resource plan.

SYLLABUS FOR THE POST OF DIETICIAN

Subject Knowledge (100 Marks)

A. Human Physiology (10 Marks):

General principles of Physiology

The Skeleton – General Account

- The Muscular System – General Account -Types of muscles, characteristics of each, Similarities and Differences.
- Blood and Circulatory System – Blood and its composition, Functions of each constituent of blood, Blood groups, Blood transfusion and its importance, Coagulation of blood, Blood vessels, Structure and functions of heart, Blood pressure, heart rate, Cardiac output and their regulation.
- Lymphatic System – Lymph, Lymph glands and functions, Spleen – Structure and Functions.
- Respiratory System – Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration.
- Digestive System – Structure and Functions of Alimentary tract. Functions of various secretions and juices – Saliva, Gastric, Bile, Intestinal, Pancreatic. Functions of enzymes in digestion. Digestion of nutrients – Proteins, Fats, Carbohydrates. Common problems of Digestive tract – Vomiting, Constipation, Diarrhoea.
- Excretory System – Structure and Functions of (a) Kidney (b) Ureter (c) Bladder (d) Skin. Urine -Formation of urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature.
- Nervous System – Structure of Nerve Cell, Fibre, Classification of Nervous System, Central Nervous System – Brain, Lobes of brain, Cerebrum, Cerebellum, Medulla oblongata, Hypothalamus. Pituitary Gland – structure, Functions, Spinal Cord – structure and functions, Autonomic and Sympathetic nervous system.
- Reproductive System – Female reproductive system – organs, structure and functions Male reproductive system– structure and functions, Menstruation, menstrual cycle, Puberty, Menarche, Menopause, Fertilization of ovum, Conception, Implantation
- Sense Organs – Eye – structure and function, Ear – structure and function, Skin -structure and function
- Glands and Endocrine System – o Liver – structure and function o Gall Bladder – structure and function o Enterohepatic circulation o Pancreas – structure and function o Endocrine system o Endocrine glands – structure and function. Hormone – types and functions, role in metabolism.
- Endocrine disorders o Regulation of Hormone Secretion

B. Biochemistry (10 Marks):

- Introduction to Biochemistry – Significance of pH, Acid-Base Balance, Cell Structure, Composition, Organelles, Membrane and Function Alterations and Significance.
- Carbohydrates – Structure and properties of Mono-saccharides, Disaccharides, Poly-saccharides. Study of intermediary metabolism of carbohydrates, Glycolysis, Aerobic, Anaerobic, Tricarboxylic acid cycle, Significance of TCA cycle integrating metabolism of carbohydrates protein and lipid, Gluconeogenesis, Glycogenesis, Glycogenolysis, Hexose monophosphate shunt.

- Proteins – Structure, composition Classification and Function, Structure of important proteins with special reference to Insulin, myoglobin, and hemoglobin, Binding proteins and their functions – nutritional implications, Chemistry of amino acids, Metabolism of Proteins and amino acids – Build up of amino acid pool. Urea Cycle, Creatinine and Creatine Synthesis, Biochemical parameters and alterations in disease states and Protein malnutrition, Pregnancy, Inborn errors of metabolism.
- Lipids – Definition, Composition, Classification, Structure and Properties, Lipoproteins, Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of ketone bodies, Biosynthesis of fatty acids, Phosphoglycerides, Biosynthesis of cholesterol and regulation, Bile acids and their metabolism, Plasma lipoproteins – Synthesis and Metabolism, Biochemical profile, alterations and significance, Prostaglandins.
- Enzymes – Definition, Classification specificity of enzymes -Intracellular distribution, kinetics, inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis.
- Nucleic Acids – Composition, Functions, Classification, Structure and properties of DNA and RNA, Replication and transcription of genetic information, Mechanics of DNA replication, transcription, translation, Genetic code – Protein biosynthesis, Regulation of biosynthesis recombinant DNA Technology. Breakdown of purine and pyrimidine nucleotides.
- Biological Oxidation, Electron Transport Chain, Oxidative Phosphorylation.
- Hormones–Mode of Action, Regulation of Metabolism Biochemical parameters. Endocrinological abnormalities and clinical diagnosis.

C. Food Microbiology, Sanitation And Hygiene (10 Marks):

- Introduction to Microbiology – Mold, Yeast, Bacteria, Viruses, Protozoa, General Classification Family, Genus, Species. Study of their morphology, cultural characteristics and biochemical activities. Important microorganisms in foods, general.
- Growth curve of a typical bacterial cell – Effect of intrinsic and extrinsic factors on growth of organisms, pH, water activity, 0- R potential, nutritional requirements, temperature, relative humidity and gaseous environment.
- Primary sources of micro-organisms in foods – Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization.
- Fundamentals of control of micro- organisms in foods – Extrinsic and intrinsic parameters affecting growth and survival of organisms. Use of high and low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation, and use of preservatives in food. Storage of food correct handling and techniques of correct storage, Temperatures at which growth is retarded and bacteria are killed, Storage temperatures for different commodities to prevent growth or contamination and spoilage.
- Food spoilage and contamination indifferent kinds of foods and their prevention – Cereal and cereal products, pulses and legumes, Vegetables and fruits, Meat and meat products, Eggs and poultry, Milk and milk products.
- Public health hazards due to contaminated foods – Food poisoning and infections -Causative agents, symptoms, sources and mode of transmission, foods involved, Method of prevention, Fungal toxins, Investigation and detection of food-borne disease outbreak.
- Microbes used in biotechnology – Useful micro-organisms, Fermented foods – raw material used, organisms and the product obtained, Benefits of fermentation.
- Indices of food, milk and water sanitary quality. Microbiological criteria of food, water and milk testing. Food standards, PFA, FPO, BNS, MPO, Agmark, Codex Alimentarius.
- Hygiene and its importance and application – Personal hygiene – care of skin, hair, hands, feet, teeth, Use of cosmetics and jewellery, Grooming, Uniform, Evaluation of personal hygiene, Training staff.
- Safe handling of food – Control measures to prevent food borne diseases and precautions to be taken by food handlers. Reporting of cold, sickness, boils, septic wounds etc.
- Rodents and Insects as carriers of food-borne diseases. Control techniques.

- Disinfectants, sanitizers, antiseptic and germicide. Common disinfectants used on working surfaces, kitchen equipment, dish washing, hand washing etc. Care of premises and equipment, cleaning of equipment and personal tools immediately after use, use of hot water in the washing process.
- Waste disposal, collection, storage and proper disposal from the premises.
- Legal administration and quality control, laws relating to food hygiene.

D. Human Nutrition and Meal Management (10 Marks):

- Concept and Definition of terms – Nutrition, Malnutrition, Health, Brief history of Nutritional Science.
Scope of Nutrition.
Minimum Nutritional Requirements and RDA. Formulation of RDA and Dietary Guidelines – Reference Man and Reference Woman.
- Body Composition and Changes through the Life Cycle.
- Energy in Human Nutrition – Energy Balance, Assessment of Energy Requirements.
- Proteins – Protein Quality (BV, PER, NPU), Digestion and Absorption, Factors affecting protein bio-availability including Anti nutritional factors.
- Requirements.
- Lipids – Digestion and Absorption, Intestinal resynthesis of triglycerides – Types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, W-3)
- Carbohydrates– Digestion and Absorption. Blood glucose and Effects of different carbohydrates on blood glucose, glycaemic index.
- Dietary Fibre – Classification, Composition, Properties and Nutritional status significance.
- Minerals and Trace Elements – Physiological role, Bioavailability and Requirements.
- Vitamins– Physiological role, Bioavailability and Requirements.
- Water – Functions, Requirements.
- Nutritional requirements for different age groups with rationale. Factors affecting these requirements.
- Effect of cooking and home processing on digestibility and nutritive value of foods.

E. Community Nutrition (10 Marks):

- Improving nutritional value through different methods – germination, fermentation, combination of foods.
- Basic principles of meal planning.
- Nutritional considerations for planning meals for Adults – male and female, different levels of physical activity.
- Pregnancy and Lactation
- Feeding of young children 0 -3 years
- Old age
- Athletes
- Nutritional considerations in brief for the following: Military, naval personnel
- Astronauts and food for space travel• Emergencies such as drought, famine, floods etc.
- Concept and Scope of Community Nutrition.
- Food availability and factors affecting food availability and intake.
- Agricultural production, post-harvest handling (storage & treatment), marketing and distribution, industrialization, population, economic, regional and socio-cultural factors. Strategies for augmenting food production.

- Assessment of Nutritional status – meaning, need, objectives and importance. Use of clinical signs, anthropometry, biochemical tests, and biophysical methods. Assessment of food and nutrient intake through recall, record, weighment. Food security and adequacy of diets.
- Use of other sources of information for assessment.
- Sources of relevant statistics.
- Infant, child and maternal mortality rates.
- Epidemiology of nutritionally related diseases.
- Nutritional problems of communities and implications for public health. Common Nutritional Problems in India. Incidence – National, Regional.
- Causes: Nutritional and Non Nutritional signs, symptoms, effect of deficiency and treatment
- PEM
- Micronutrient Deficiencies Fluorosis o Correction/Improvements in Diets 6. Schemes and Programs in India to combat Nutritional Problems in India. Role of International, National and Voluntary agencies and Government departments.
- Hazards to Community Health and Nutritional status
 - Adulteration in food
 - Pollution of water, air
 - Waste management
 - Industrial effluents, sewage
 - Pesticide residue in food
 - Toxins present in food – mycotoxins etc.
- Nutrition Policy of India and Plan of Action.
- Health and Nutrition Education – Steps in planning, implementation, and evaluations. Use of educational aids – visual, audio, audio-visual, traditional media etc.

F. Diet Therapy (30 Marks):

- Diet Therapy and Nutritional Care in Disease
 - (i) The Nutritional Care Process
 - (ii) Nutritional Care Plan
 - (iii) Assessment and Therapy in Patient Care
 - (iv) Implementation of Nutritional Care
- Nutritional Intervention– Diet Modifications
 - (i) Adequate normal diet as a basis for therapeutic diets
 - (ii) Diet Prescription
 - (iii) Modification of Normal Diet
 - (iv) Nomenclature of Diet Adequacy of Standard Hospital Diets
 - (v) Psychological factors in feeding the sick person
- Interactions between Drugs, Food Nutrients and Nutritional Status
- Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements.
 - (i) Drugs affecting intake of food and nutrients
 - (ii) Absorption
 - (iii) Metabolism and excretion
 - (iv) Nutritional status
 - (v) Summary of action of some common drugs
 - (vi) Effect of food, nutrients and nutritional status on absorption and metabolism of drugs
- Disease of the G. I. System – Nutritional Assessment
- Pathogenesis of G.I. Disease with special reference to upper G. I. Tract and ulcers.
- Diseases of esophagus and dietary care
- Diseases of stomach and dietary care
- Gastric and duodenal ulcers
- Predisposing factors and Treatment

- Brief medical therapy, rest, antacids, other drugs and dietary care
- Food acidity, foods that cause flatulence, factors that damage G. I. Mucosa
- Foods stimulating G. I. Secretion
- Diet and Eating Pattern
- Diet Recommendations
- Liberal Approach Vs Traditional Approach
- Possible nutritional and dietary inadequacies
- Gastrostomy
- Intestinal Diseases
- Flatulence, Constipation, Irritable Bowel, Haemorrhoids, Diarrhoea, Steatorrhoea, Diverticular disease, Inflammatory Bowel Disease, Ulcerative Colitis.
- Treatment and Dietary Care in the above mentioned conditions.
- Malabsorption Syndrome
- Celiac Sprue, Tropical Sprue
- Intestinal Brush border deficiencies (Acquired Disaccharide Intolerance)
- Protein Losing Enteropathy
- Dietary Care Process
- Diet in Diseases of the Liver, Pancreas and Biliary System
- Nutritional care in Liver disease in the context of results of specific Liver Function Tests.
- Dietary Care & Management in Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's disease.
- Dietary care and management in diseases of Gall Bladder and Pancreas.
- Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis, Zollinger-Ellison Syndrome.
- Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycaemia Classification
- Physiological symptoms and disturbances, diagnosis (FBG and OGTT)
- Management of Diabetes Mellitus
- Clinical Vs Chemical control
- Hormonal Therapy
- Oral Hypoglycemic Agents
- Home Glucose Monitoring
- Glycosylated Hemoglobin
- Urine Testing
- Exercise
- Dietary care and Nutritional Therapy – The Diet Plan, Meal planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes
- Diabetes in Pregnancy, Elderly, Surgery, Diabetic diets in Emergency, Illness, Diabetic coma, Insulin reaction, Juvenile diabetes, Patient Education in Diabetes
- Hypoglycaemia -classification, symptoms, fasting state hypoglycaemia, Postprandial or reactive hypoglycaemia, Early alimentary and late reactive hypoglycaemia, Idiopathic hypoglycaemia, Dietary treatment in reactive hypoglycaemia.
- Dietary care in diseases of the Adrenal Cortex, Thyroid gland and Parathyroid gland.
- Functions of the gland and hormones and their insufficiency, metabolic implications, clinical symptoms.
- Dietary treatment as supportive to other forms of therapy
- Adrenal cortex insufficiency, Hyper and Hypothyroidism (goitre), Hypoglycaemia.
- Nutritional care for Weight Management
- Regulation of energy intake and balance of body weight
- Control of appetite and food intake–
 - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
- Identifying the obese
- Types of obesity, Health risks
- Causes, Psychology of obesity, Theories of obesity, Physiology of the obese state
- Thermogenesis, Thyroid hormones
- Treatment of Obesity
- Diets in Obesity – Starvation, Fasting

- Evaluation of some common diets, Protein-sparing modified fast, High protein diets
- Balanced Energy Reduction
- Foods to include, fibre foods allowed as desired, alcohol, snacks and beverages
- Psychology of weight reduction

- Behavioural Modification –
 - Psychotherapy, pharmacology, exercise & physical activity, Surgery, prevention of weight gain & obesity.
- Underweight– Etiology and Assessment, High calorie diets for weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia
- Diseases of the Circulatory System
 - Atherosclerosis – Etiology, risk factors, diet
 - Hyperlipidemias
 - Brief review of Lipoproteins and their metabolism
 - Clinical and nutritional aspects of Hyperlipidemias
 - Classification and Dietary care of Hyperlipidemias
 - Nutritional care in Cardiovascular disease
- Ischemic heart disease Pathogenesis of sodium and water retention in Congestive Heart Disease. Acute and Chronic Cardiac Disease, Acute
- Stimulants, food & consistency, Chronic – Compensated and decompensated states, Sodium Restriction in Cardiac Diseases, Diet in Hypertension – Etiology, Prevalence, Renin-
- Angiotensin mechanism, Salt and Blood pressure, Drugs and Hypertension, Cerebrovascular diseases and diet in brief)
- Anemia
- Resulting from Acute Haemorrhage
- Nutritional anaemia
- Sickle cell anaemia
- Thalassemia
- Pathogenesis and dietary management in the above conditions
- Renal Disease
- Physiology & function of normal kidney – a brief review
- Diseases of the kidney, classification
- Glomerulo nephritis – Acute and Chronic– Etiology, Characteristics, Objectives, Principles of Dietary
- Treatment and Management
- Nephrotic syndrome – objectives, principles of Dietary Treatment and Management.
- Uremia and Renal Failure
- History, General Principles of Protein
- Nutrition in Renal Failure and Uremia.
- Acute Renal Failure– Causes, dietary management fluid, sodium and potassium balance, protein and energy requirements
- Chronic renal failure medical treatment, Renal transplants. Dialysis and types haemodialysis, Peritoneal Dialysis & Continuous Ambulatory Peritoneal Dialysis (CAPD). Dietary Management in conservative treatment, dialysis and after renal transplantation.
- Use of Sodium and Potassium
- Exchange lists in Renal (diet planning). □ Chronic renal failure in patients with diabetes mellitus
- Chronic renal failure in children
- Nephrolithiasis – Etiology, types of stones, Nutritional care, alkaline-ash diets
- Allergy
- Definitions, symptoms, mechanism of food allergy
- Diagnosis– History, Food record
- Biochemical and Immunotesting (Brief)
- Elimination diets
- Food selection □ Medications (brief)

- Prognosis food Allergy in infancy
- Milk sensitive enteropathy; Colic, Intolerance to breast milk, prevention of Food Allergy.
- Diseases of Nervous System, Behavioural Disorders and Muscular Skeletal System
- Neuritis and polyneuritis
- Migraine, headache
- Epilepsy
- Multiple sclerosis
- Hyperkinetic Behaviour Syndrome □ Orthomolecular psychiatry and mental illness (Brief Definition, etiology, dietary treatment and prognosis in the above conditions.
- Arthritis– Rheumatoid Arthritis, Osteoarthritis, Symptoms, dietary management
- Nutrition in Cancer- Types, symptoms, detection
- Cancer therapies and treatment – side effects and nutritional implications
- Goals of care and guidelines for oral feeding
- Accommodating side effects
- Enteral tube feeding – Nasogastric, Gastrostomy, Jejunostomy
- Parenteral Nutrition
- Paediatric patients with cancer
- The terminal cancer patient
- Nutrition in Physiological Stress
- Physiological stress and its effect on body, nutritional implications.
- Fevers and infections
- Surgery and Management of Surgical Conditions
- Parenteral Nutrition – Types, mode, and composition of feeds
- Tube feeding – Routes, modes, composition, care to be taken during feeding
- Dietary guidelines
- Burns

G. Nutrition Education and Dietetic Counselling (10 Marks):

- Metabolic implications – nutritional requirement
- Management and nutritional care
- Nutritional Management of Patients with HIV, AIDS
- Nutritional Management – Counselling and Management
- Goals of care
- Timing of food presentation
- Guidelines for oral feeding anti-tumour therapy
- Accommodating taste changes
- External tube feeding
- Parenteral nutrition
- Patient co-operation
- Paediatric patients with cancer
- The terminal cancer patient
- Misconceptions in nutritional care
- Dietician as part of the Medical Team and Outreach Services.
- Clinical Information – Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.
- The Care Process – Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription, Motivating Patients, Working with – Hospitalized patients (adults, paediatric, elderly, and handicapped), adjusting and adopting to individual needs.

- Outpatients (adults, paediatric, elderly, handicapped), patients' education, techniques and modes.
- Follow up, Monitoring and Evaluation of outcome, Home visits vii. Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counselling, Terminating counselling, Education for individual patients, Use of regional language, linguistics in communication process, Counselling and education.

H. Food Services Management (10 Marks):

- Introduction to food services and catering industry, Development of Food Service Institutions in India, Types of Services as affected by changes in the environment. ii. Hospital food service as a speciality – Characteristics, rates and services of the food production, service and management in hospitals. Role of the Food Service Manager /Dietician.
- Organizations – Types of organizations and characteristics.
- Organizational charts.
- Catering Management Definition, Principles and Functions, Tools of Management Resources. Attributes of a successful manager.
- Approaches to Management Traditional, Systems Approach, Total Quality Management.
- Management of Resources – Capital, Space, Equipment and Furniture, Materials, Staff, Time and Energy, Procedures Physical facility design and planning. Equipment selection.
- Purchase and store room management – Purchase systems, specifications, food requisition and inventory systems, quality assurance.
- Human Resource Management
- Definition, Development and policies
- Recruitment Selection, Induction
- Employment procedures: Employee Benefits, Training and Development, Human Relations, Job description, Job specifications, Job evaluation, Personnel appraisal.
- Trade Union
- Negotiations and Settlement.
- Financial Management (in brief since there is a separate subject Food Cost and Quality Control) – Elements of Financial management, Budget Systems and accounting, Budget preparation.
- Food Production and Service Operations
- General Planning
- Preliminary planning
- Consideration of patients with specific nutritional and dietary needs, labour use and productivity.
- Flow pattern.

SYLLABUS FOR THE POST OF DISPENSING ATTENDANTS

Subject Knowledge (100 Marks):

Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.

Metrology-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products. Use of alligation method in calculations, Isotonic solutions.

Packaging of pharmaceuticals-Desirable features of a container and types of containers. Study of glass & plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging.

Size reduction, objectives, and factors affecting size reduction, methods of size reduction- study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.

Size separation-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.

Mixing and Homogenization-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.

Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, sintered filters, Filter candles, Metafilter.

Extraction and Galenicals-

(a) Study of percolation and maceration and their modification, continuous hot extraction-Application in the preparation of tinctures and extracts.

(b) Introduction to Ayurvedic dosage forms.

Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.

Distillation-Simple distillation and Fractional distillation, steam distillation and vacuum distillation. Study of vacuum still, preparation of purified water I.P. and water for Injection I.P. construction and working of the still used for the same.

Introduction to drying process-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and FreezeDryer.

Sterilization-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process.

Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration and Gaseous sterilization.

Aseptic techniques-Applications of sterilization process in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

Processing of Tablets-Definition; different type of compressed tables and their properties. Processes involved in the production of tablets; Tablets excipients ; Defects in tablets; Evaluation of Tablets; Physical standards including Disintegration and Dissolution. Tablet coating-sugar coating; films coating, enteric coating and micro-encapsulation (Tablet coating may be de.. in an elementary manner).

Processing of Capsules-Hard and soft gelatin capsules; different sizes of capsules; filling of capsules; handling and storage of capsules. Special applications of capsules.

Study of immunological products like sera, vaccines, toxoids & their preparations.

PHARMACOGNOSY

1. Definition, history and scope of Pharmacogonosy including indigenous system of medicine.
2. Various systems of classification of drugs and natural origin.
3. Adulteration and drug evaluation; significance of pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.
 - (a) **Laxatives**- Aloe, Rhubarb, Castor oil, Ispaghula, Senna.
 - (b) **Cardiotonics**- Digitalis, Arjuna.
 - (c) **Carminatives & G.I. regulators**- Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom, Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.
 - (d) **Astringents**- Catecheu.
 - (e) **Drugs acting on nervous system**- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux -vomica.
 - (f) **Antihypertensive**- Rauwolfia.
 - (g) **Antitussives**- Vasaka, Tolu balsam, Tulsi.
 - (h) **Antirheumatics**- Guggal, Colchicum.
 - (i) **Antitumour**- Vinca.
 - (j) **Antileprotics**- Chaulmoogra oil.
 - (k) **Antidiabetics**- Pterocarpus, Gymnema sylvestro.
 - (l) **Diuretics**- Gokhru, Punarnava.
 - (m) **Antidysenterics**- Ipecacuanha.
 - (n) **Antiseptics and disinfectants**- Benzoin, Myrrh, Neem, Curcuma.
 - (o) **Antimalarials**- Cinchona.
 - (p) **Oxytocics**- Ergot.
 - (q) **Vitamins**- Shark liver oil and Amla.
 - (r) **Enzymes**- Papaya, Diastase, Yeast.
 - (s) **Perfumes and flavoring agents**- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandalwood.

Pharmaceutical aids-Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guar gum, Gelatin.

Miscellaneous- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankhpushpi, pyrethrum, Tobacco.

Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings- cotton, silk, wool and regenerated fibers.

Gross anatomical studies of-senna, Datura, cinnamon, cinchona, fennel, clove, Ginger, Nuxvomica & ipecacuanha.

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Introduction to biochemistry. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

Carbohydrates: Brief chemistry and role of carbohydrates, classification, qualitative tests, Diseases related to carbohydrate metabolism.

Lipids: Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to lipids metabolism.

Vitamins: Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in life processes.

Enzymes: Brief concept of enzymatic action. factors affecting it.

Therapeutics: Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in health and disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

HUMAN ANATOMY AND PHYSIOLOGY

Scope of Anatomy and physiology. Definition of various terms used in Anatomy. Structure of cell, function of its components with special reference to mitochondria and microsomes.

Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

Skeletal System: Structure and function of Skeleton .Classification of joints and their function. Joint disorders.

Cardiovascular System: Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood. Name and functions of lymph glands. Structure and functions of various parts of the heart .Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration.

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology of renal diseases and edema.

Muscular System: Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. physiology of neuromuscular junction.

Central Nervous System: Various parts of central nervous system, brain and its parts, functions and reflexion. Anatomy and physiology of automatic nervous system.

Sensory Organs: Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

Digestive System: names of various parts of digestive system and their functions. structure and functions of liver, physiology of digestion and absorption.

Endocrine System: Endocrine glands and Hormones. Location of glands, their hormones and functions. pituitary, thyroid. Adrenal and pancreas

Reproductive system: Physiology and Anatomy of Reproductive system.

HEALTH EDUCATION AND COMMUNITY PHARMACY

Concept of health: Definition of physical health, mental health, social health, spiritual health determinants of health, indicator of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

Nutrition and health: Classification of foods, requirements, diseases induced due to deficiency of proteins, vitamins and minerals-treatment and prevention.

Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.

First aid: Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.

Environment and health: Source of water supply, water pollution, purification of water, health and air, noise, light-solid waste disposal and control-medical entomology, arthropod borne diseases and their control. rodents, animals and diseases.

Fundamental principles of microbiology: Classification of microbes, isolation, staining techniques of organisms of common diseases.

Communicable diseases: Causative agents, mode of transmission and prevention. Respiratory infections- chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.

Intestinal infection-poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.

Arthropod borne infections-plague, Malaria, filariases. **Surface infection-**Rabies, Trachoma, Tetanus, Leprosy. **Sexually transmitted diseases-**Syphilis, Gonorrhoea, AIDS.

Non-communicable diseases: causative agents, prevention, care and control.

Epidemiology: Its scope, methods, uses, dynamics of disease transmission. Immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

PHARMACEUTICS (Dispensing Pharmacy)

Prescriptions-Reading and understanding of prescriptions; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved in dispensing.

Incompatibilities in prescriptions- study of various types of incompatibilities-physical, chemical and therapeutic.

Posology- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age, sex, surface area and veterinary doses.

Dispensed Medications: (Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. special labeling requirements and storage conditions should be high-lighted).

Powders-Type of powders-Advantages and disadvantages of powders, Granules, cachets and tablet triturates. preparation of different types of powders encountered in prescriptions. Weighing methods, possible errors in weighing, minimum weighable amounts and weighing of a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

Liquid oral Dosage forms:

Monophasic-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colorants and flavors, with examples.

Review of the following monophasic liquids with details of formulation and practical methods. Liquids for internal administration Liquids for external administration or used on mucous membranes

Mixtures and concentrates, Gargles

Syrups Mouth washes

Douches

Sprays

Throat-paints

Ear Drops

Liniments

Elixirs

Nasal drops

Lotions.

Biphasic Liquid Dosage Forms:

Suspensions (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant used like thickening agents, wetting agents, their necessity and quantity to be incorporated, suspensions of precipitate forming liquids like tinctures, their preparations and stability. suspensions produced by chemical reaction. An introduction to flocculated /non-flocculated suspension system.

Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

Semi-Solid Dosage Forms:

Ointments: Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes:

Trituration

chemical reaction

fusion

Emulsification.

Pastes: Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation .

Jellies: An introduction to the different types of jellies and their preparation. An elementary study of poultice.

Suppositories and pessaries- Their relative merits and demerits, types of suppositories, suppository bases, classification, properties, preparation and packing of suppositories. Use of suppositories of drug absorption.

Dental and cosmetic preparations: Introduction to Dentifrices, facial cosmetics, Deodorants. Antiperspirants, shampoo, Hair dressings and Hair removers.

Sterile Dosage forms:

Parenteral dosage forms- Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures- Total parenteral nutrition, Dialysis fluids.

Sterility testing: particulate matter monitoring- Faculty seal packaging.

Ophthalmic products: study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

PHARMACEUTICAL CHEMISTRY

1. Introduction to the nomenclature of organic chemical systems with particular reference to heterocyclic system containing up to 3 rings.
2. The chemistry of following pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties (chemical structure of only those compounds marked with asterisk (*)). The stability and storage conditions and the different type of pharmaceutical formulations of these drugs and their popular brand names.

Antiseptics and Disinfectants- Proflavine*, Benzalkonium chloride, Cetrimide, Phenol, chloroxylenol, Formaldehyde solution, Hexachlorophene, Nitrofurantoin.

Sulphonamides- Sulphadiazine, Sulphaguanidine, Phthalylsulphathiazole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxypyridazine, Co-trimoxazole, sulfacetamide*

Antileprotic Drugs- Clofazimine, Thiambutosine, Dapsone*, solapsone,

Anti-tubercular Drugs- Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide*.

Antimoebic and Anthelmintic Drugs- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin, Piperazine*, Mebendazole, D.E.C.*

Antibiotics- Benzyl penicillin*, Phenoxy methyl penicillin*, Benzathine penicillin, Ampicillin*, Cloxacillin, Carbenicillin, Gentamicin, Neomycin, Erythromycin, Tetracycline, Cephalexin, Cephaloridine, Cephalothin, Griseofulvin, Chloramphenicol.

Antifungal agents- Udecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

Antimalarial Drugs- Chloroquine*, Amodiaquine, Primaquine, Proguanil, Pyrimethamine*, Quinine, Trimethoprim.

Tranquilizers- Chlorpromazine*, Prochlorperazine, Trifluoperazine, Thiothixene, Haloperidol*, Triperiodol, Oxypertine, Chlordizepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics- Phenobarbitone*, Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide*, Methypylon, Paraldehyde, Triclofosodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopental sodium, Trichloroethylene .

Antidepressant Drugs- Amitriptyline, Nortriptyline, Imipramine*, Pheipazine, Tranylcypromine.

Analeptics- Theophylline, Caffeine*, Coramine*, Dextro-amphetamine.

Adrenergic drugs- Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine, Salbutamol, Terbutaline, Ephedrine*, Pseudoephedrine.

Adrenergic antagonist- Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs- Neostigmine*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*.

Cholinergic Antagonists- Atropine*, Hyoscine, Homatropine, Propantheline*, Benztropine, Tropicamide, Biperiden*.

Diuretic Drugs- Furosemide*, Chlorothiazide, Hydrochlorothiazide*, Benzthiazide, Urea*, Mannitol*, Ethacrynic Acid.

Cardiovascular Drugs- Ethylnitrite*, Glyceryl trinitrate, Alpha methyl dopa, Guanethidine, Clofibrate, Quinidine.

Hypoglycemic Agents- Insulin, Chlorpropamide*, Tolbutamide, Glibenclamide, Phenformin*, Metformin. **Coagulants and Anti coagulants**- Heparin, Thrombin, Menadione*, Bisphydroxycoumarin, Warfarin sodium.

Local Anaesthetics- Lignocaine*, Procaine*, Benzocaine,

Histamine and anti Histaminic Agents- Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine*, Pheniramine, Chlorpheniramine*,

Analgesics and Anti-pyretics-Morphine, Pethidine, Codeine, Methadone, Aspirin*, Paracetamol, Analgin, Dextropropoxyphene, Pentazocine.

Non-steroidal anti-inflammatory agents- Indomethacin*, Phenylbutazone*, Oxyphenbutazone, Ibuprofen.

Thyroxine and Antithyroids- Thyroxine*, Methimazole, Methyl thiouracil, Propylthiouracil.

Diagnostic Agents- Lophanic Acid, Propylidone, Sulfobromophthalein-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.

Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.

Steroidal Drugs- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

Anti-Neoplastic Drugs- Actinomycin, Azathioprine, Busulfan, Chlorambucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochloride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

PHARMACOLOGY & TOXICOLOGY

Introduction to Pharmacology, Scope of Pharmacology.

Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

General mechanism of drugs action and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

Drugs acting on the central Nervous system:

General anaesthetics- adjunction to anaesthesia, intravenous anaesthetics. Analgesic antipyretics and non-steroidal

Anti-inflammatory drugs- Narcotic analgesics. Antirheumatic and anti-gout remedies.

Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics. Centrally acting muscle relaxants and anti-parkinsonism agents. Local anesthetics.

Drugs acting on autonomic nervous system.

Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs. Adrenergic drugs and adrenergic receptor blockers.

Neurone blockers and ganglion blockers. Neuromuscular blockers, used in myasthenia gravis.

Drugs acting on eye: Mydriatics, drugs used in glaucoma.

Drugs acting on respiratory system, Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

Autocoids: physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins. Cardio vascular drugs, Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.

Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic, Blood substitutes and plasma expanders.

Drugs affecting renal function- Diuretics and anti-diuretics.

Hormones and hormone antagonists- Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives, corticosteroids.

Drugs acting on digestive system- carminatives, digest ants, Bitters, Antacids and drugs used in pepticulcer, purgatives and laxatives, Anti-diarrohoeals, Emetics, Anti-emetics, Antispasmodics.

Chemotherapy of microbial diseases:

Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti-tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs. Chemotherapy of protozoal diseases, Anthelmintic drugs. Chemotherapy of cancer.

PHARMACEUTICAL JURISPRUDENCE

Origin and nature of pharmaceutical legislation in India, its scope and objectives. Evolution of the "Concept of pharmacy" as an integral part of the Health care system.

Principles and significance of professional Ethics. Critical study of the code of pharmaceutical Ethics drafted by pharmacy council of India.

Pharmacy Act, 1948-The General study of the pharmacy Act with special reference to Education Regulations, Working of state and central councils, constitution of these councils and functions, Registration procedures under the Act.

The Drugs and Cosmetics Act, 1940-General study of the Drugs and cosmetics Act and the Rules there under. Definitions and salient features related to retail and whole sale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licenses

under the rule. Facilities to be provided for running a pharmacy effectively. General study of the schedules with special reference to schedules C,C1,F,G,J,H,P and X and salient features of labeling and storage conditions of drugs.

The Drugs and Magic Remedies (objectionable Advertisement) Act, 1954-General study of the Act, objectives , special reference to be laid on Advertisements, magic remedies and objections¹ and permitted advertisements -diseases which cannot be claimed to be cured.

Narcotic Drugs and psychotropic substances Act, 1985-A brief study of the act with special reference to its objectives, offences and punishment.

Brief introduction to the study of the following acts:

Latest Drugs (price control) order in force (as amended to date)

Medicinal and Toilet preparations (excise Duties) Act, 1955 (as amended to date). Medical Termination of Pregnancy Act, 1971.

DRUG STORE AND BUSINESS MANAGEMENT

Introduction-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

Drug House Management-selection of site, space Lay-out and legal requirements. Importance and objectives of purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto. Codification, handling of drug stores and other hospital supplies. Inventory Control-objects and importance, modern techniques like ABC,VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.

Sales promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.

Recruitment, training, evaluation and compensation of the pharmacist.

Banking and Finance-Service and functions of bank, Finance planning and sources of finance.

HOSPITAL AND CLINICAL PHARMACY

Hospital-Definition, Function, classifications based on various criteria,organization, Management and health delivery system in India.

Hospital Pharmacy: Definition Functions and objectives of Hospital pharmaceutical services. Location,Layout, Flow chart of materials and men.

Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

Drug Distribution system in Hospitals. Out-patient service, In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system, satellite pharmacy services, central sterile services, Bed side pharmacy.

Manufacturing: Economical considerations, estimation of demand.

Sterile manufacture-Large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

Non-sterile manufacture-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

Hospital Formulary system and their organization, functioning, composition.

Drug Information service and Drug Information Bulletin.

Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V.sets, B.G. sets, Ryals tubes, Catheters, Syringes etc.

Application of computers in maintenance of records, inventory control, medication monitoring, drug information and data storage and retrieval in hospital retail pharmacy establishment.

Clinical Pharmacy:

Introduction to Clinical pharmacy practice- Definition, scope.

Modern dispensing aspects- Pharmacists and patient counseling and advice for the use of common drugs, medication history.

Common daily terminology used in the practice of Medicine.

Disease, manifestation and patho-physiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Physiological parameters with their significance.

Drug Interactions: Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.

Adverse Drug Reaction: Definition and significance. Drug-Induced diseases and Teratogenicity.

Drugs in Clinical Toxicity- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organophosphorus poisons.

Drug dependences, drug abuse, addictive drugs and their treatment, complications.

Bio-availability of drugs, including factors affecting it.

SYLLABUS FOR THE POST OF DISSECTION HALL ATTENDANT

A. General Intelligence and Reasoning (25 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (25 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (25 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart

D. English Language (25 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (25 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

SYLLABUS FOR THE POST OF DRIVER (ORDINARY GRADE)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

Questions on Driving Technique & Motor Car Mechanism shall aim at testing the candidate's knowledge of driving skills and procedures, duties of drivers, fuel efficiency and fuel economy, basic maintenance of the vehicle, servicing, emergency handling techniques, tools and documents required with the vehicle, types of vehicles, traffic Rules & Regulations, ability to recognize traffic signals, traffic signs, hand signals and road markings, simple queries about the assemblies of vehicle systems, etc. Basic Life Support and Knowledge of First AID, Pollution and Environment, Causes and types of accidents, Drivers responsibility in the event of accident, road rage and stress management, Basic knowledge of AIDS.

SYLLABUS FOR THE POST OF ELECTRICIAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.
- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, dia and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len's law, Capacitor, Types of functions

- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

SYLLABUS FOR THE POST OF GAS PUMP MECHANIC

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (80 Marks):

- (i) General Science (10+2 level): Questions based on Physics, Chemistry and Biology subjects of 10+2 standard.
- (ii) ITI (Mechanical Engineering/Pump Mechanic): Questions based on the syllabus of NCVT ITI (Mechanical Engineering/ Pump Mechanic) trade certificate.
- (iii) Practical Knowledge of Medical Gas System:
 1. Gas Distribution Systems: Compressed gas cylinders, Colour coding, Cylinder valves; Pin index, Gas piping system, Recommendations for piping system, Alarms & safety devices.

2. MGPS Design and Techniques: Statutory obligations and safe system operation, MGPS design and installation requirements, Basic fault-finding, Structure and management of the permit-to work system, MGPS equipment performance requirements (plant and pipeline); Technical reporting including system capacities/limitations, upgrading requirements/equipment replacement, system compliance.
3. MGPS Policies and documentation: MGPS documentation; Emergency procedures; MGPS operational policy preparation, implementation and monitoring; MGPS testing and quality control requirements; Manifold systems; Cryogenic liquid cylinders; Bulk cryogenic (VIE) systems Alarm requirements.
4. Piping materials and specification of W.I. & steel pipes, Pipe threads, Pipe fittings, Specifications of fittings, Brief description of different types of pipe joints, Pipe fittings, Flanges, Unions, Valves etc., Different types of pipes lay out systems, Different types of pipe joints.
5. Working principals of valves and their description.
6. Mechanical faults on terminal outlets, Line regulators, Zone valve boxes and faults on electrically controlled line, Pressure alarms.
7. Oxygen acetylene welding procedure of medical gas pipeline using inert gas shielding
8. Installation, maintenance and repair of liquid oxygen plant and high-pressure cylinder manifolds
9. Types of many gas manifolds.
10. Manifolds selection criteria.
11. Manifolds assemblies.
12. Semi- automatic manifolds.
13. Manifolds accessories.
14. Manifolds valves etc.

SYLLABUS FOR THE POST OF HEALTH EDUCATOR (SOCIAL PSYCHOLOGIST)

Subject Knowledge (100 Marks):

A. Basic Psychology (10 Marks):

- Psychophysics and Perception
- Signal detection theory, subliminal perception and related factors, information processing approach to perception, culture and perception, perceptual styles. Ecological perspective on perception.
- Perceptual Processes
- Approaches to the Study of Perception: Gestalt and physiological approaches. • Perceptual Organization: Gestalt, Figure and Ground, Laws of Organization.
- Perceptual Constancy: Size, Shape and Brightness, Illusion; Perception of Depth and Movements. • Role of motivation and learning interception
- Motivation Basic Motivational Concepts: Instincts, needs, drives, incentives, motivational cycle. Approaches to the Study of Motivation : Psychoanalytical, ethological, S – R
- Cognitive, humanistic. Biological Motives: Hunger, thirst, sleep and sex. Social Motives :
- Achievement, affiliation, approval Exploratory behaviour and curiosity
- Motivation and Emotion Physiological correlates of emotions. • Theories of emotions: James – Lange, Cannon –
- Bard, Schachter and Singer. Conflicts: Sources and types

B. Social Psychology (10 Marks):

- Current trends in Social Psychology. Historical Background: Growth of social psychology, Methods of social psychology. Theoretical perspective: Cognitive dissonance, Social comparison, Attribution, Field
- Psychoanalytic, Symbolic interactions, Socio-biology.
- Social cognition. Person perception, impression management. Role of Stereotypes in person Perception types of influence process.
- Social Influence Processes: Leadership
- Attitude: Nature and Characteristics, Development and change. Theories of attitude change.
- Pro social behaviour, aggression and violence. Nature, Characteristics, Determinants, Theories.

C. Research Methodology-1 (10 Marks):

- Research Methodology • Types of psychological research. • Methods of Psychological Research:
- Experimental, Quasi – experimental, case studies, field studies and cross – cultural studies. • Variables: Nature and types. Techniques of experimental manipulation control in experiment.
- Sources of bias. Ethical issues in psychological research, Research Process: Consideration of research problem and hypothesis,
- Operationalization. Sampling: probability and nonprobability sampling.
- Research designs: Cross Sectional and Longitudinal Correlation, factorial, randomized block, matched group, quasi – experimental, Graeco Latin Square time series design
- Central tendencies, Dispersion, Normal Probability Curve, its properties and utility in inferential statistics, Null hypothesis, Type I and Type II errors, Levels of significance.

D. Research Methodology-2 (10 Marks):

- Experimental Design: Single Factor, Randomized block, 2X2 factorial design, repeated measures (on one factor),
- ANOVA: one-way and two-way: Randomized and Repeated Measure Design.

- ANCOVA, Post ANOVA tests.
- Measures of relationships: bi-serial, point bi-serial, tetracoric and phi, Multiple and partial Correlations.
- Regression: simple and multiple, Factor Analysis: Assumptions
- ,Methods Rotation and interpretation Use of computer in psychological researches, Research report writing

E. Psychopathology (10 Marks):

- Concept of Psychopathology, Classification systems in psychopathology: W.H.O. (ICD-10) and multiracial systems (DSMIVTR): Evaluation of classification system.
- Theoretical background, approaches to psychopathology
- (1)Psychodynamic. (2) Behavioural.
- (3) Cognitive. (4) Phenomenological. (5) Biological. (6) Socio cultural; Diagnosis – purposes of diagnosis, reducing undesirable Variability: diagnostic system.
- Anxiety disorder : Panic, Phobic,
- OCD, Post – Traumatic, GAD, somatoform disorders, Impulse control disorder, eating disorder, Sleep disorder, dissociative: Types, symptoms and management.
- Psychotic disorders: Schizophrenia, Mood disorder. Personality disorder (cluster categories and problems), types & symptoms: Types, Symptoms and management.
- Substance related disorders. Mental Retardation and developmental
- Disorders

F. Basic Psychological Processes (10 Marks):

- Learning Process: Classical conditioning: Procedure, Phenomena and related issues. Instrumental learning: Phenomena, Paradigms and theoretical issues. Process, Escape
- Conditioning, Avoidance Conditioning, Generalization. Reinforcement: Basic variables and schedules.
- Experimental analysis of behaviour: Behaviour modification, shaping Discrimination learning.
- Neurophysiology of learning.
- Verbal learning: Methods and materials, organizational processes
- Learning theories: Hull, Tolman, and Skinner. Cognitive approaches in learning: Latent
- learning, observational learning
- Memory and forgetting • Memory
- Processes: Encoding, Storage, Retrieval.
- Stages of Memory: Sensory memory, Short-term Memory (STM) and Long – term

G. Cultural Psychology (10 Marks):

- Memory (LTM).
- Episodic and Semantic memory.
- Theories of Forgetting: Interference, decay, retrieval

H. Psychology and Health Behaviour (10 Marks):

- Group Dynamics and Group behaviour, Group effectiveness, and Group Cohesiveness: meanings, formation, decision making, problem solving and group level behaviours.
- Leadership: Meaning and nature, function, styles and effectiveness.
- Social issues: Poverty, Caste, gender, population issues in India, Communal tension and harmony. Culture and Behaviour I: Culture and Cognition and emotion. Culture and Organisation.
- Culture and Behaviour II: Culture and Health. Culture and Personality. Social psychology: Health, Environment and Law Methods and Basic concepts
- Methods of Physiological psychology:
- Lesion and Brain Stimulation. Receptors, effectors and adjuster mechanisms.

- Neural impulse: Origin, conduction and measurement.
- Sensory system: Vision and Audition.
- Human nervous system: Structure and functions.
- Sleep and waking: Stages of sleep, Disorders of sleep and Physiological mechanisms of sleep andwaking.
- Drinking and its neural mechanism; hunger and its neural mechanism.
- Endocrine System: Chemical and glandular.
- Approach to therapy (Psychoanalytic,] Biological Behavioural, Behavioural medicine and spiritual therapy).

I. Basic Psychiatry-1 (10 Marks):

- Mental health promotion and maintenance, present issues and trends in health psychology
- Disorders of consciousness, attention, motor behaviour, orientation, experience of self, speech, thought, perception, emotion, and memory.
- Psychoses: Schizophrenia, affective disorders, delusional disorders and other forms of psychotic disorders – types, clinical features, ethology and management.
- Neurotic, stress-related and somatoform disorders: types, clinical features, ethology and management.
- Disorders of personality and behaviour: Specific personality disorders; mental & behavioural disorders due to psychoactive substance use; habit and impulse disorders; sexual disorders and dysfunctions – types, clinical features, ethology and management.
- Organic mental disorders: Dementia, delirium and other related conditions with neuralgic and systemic disorders – types, clinical features, ethology and management

J. Basic Psychiatry-2 (10 Marks):

- Behavioural, emotional and developmental disorders of childhood and adolescence: types, clinical features, ethology and management. Mental retardation: Classification, ethology and management.
- Neurobiology of mental disorders: Neurobiological theories of psychosis, mood disorders, suicide, anxiety disorders, substance use disorders and other emotional and behavioural syndromes. Therapeutic approaches: Drugs, ECT, psychosurgery, psychotherapy, and behaviour therapy, preventive and rehabilitative strategies – half-way home, sheltered workshop, day-care, and institutionalization.
- Consultation-liaison psychiatry: Psychiatric consultation in general hospital; primary care setting.
- Special populations/Specialties: Geriatric, terminally ill, HIV/AIDS, suicidal, abused, violent and no cooperative patients; psychiatric services in community, and following disaster/calamity

SYLLABUS FOR HOSPITAL ATTENDANT GRADE III

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

1. Meeting the Basic Needs of a patient
 - (a) **Physical needs-**
 - Comfort, rest, sleep and exercise
 - Body mechanics- moving, lifting, transferring
 - Position and posture maintenance
 - Beds and Bed making – Principles of bed making, types and care of bed linen
 - Safety devices, restraints and splints'
 - (b) **Hygienic needs**
 - Personal and environmental hygiene
 - Attendants role in maintaining personal and environmental hygiene

(c) **Elimination needs**

- Problems- constipation and diarrhoea, retention and incontinence of urine
- Offering bed-pan, urinal.

2. First Aid- Definition, Aim and Importance, rules/general principles of First Aid, first aid in emergencies
3. Procedures and Techniques in First Aid
 - Preparation of first aid kit
 - Dressing, bandaging and splinting etc.
 - Transportation of the injured
 - CPR and Basic Life Support.

SYLLABUS FOR JUNIOR ACCOUNTS OFFICER (ACCOUNTANT)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (5 Marks):

Candidates' ability to understand correct English, his basic comprehension and writing ability, etc. would be tested.

E. Government Accounting System & Budgeting (45 Marks):

Introduction of Government Accounting System and Government Budgeting, GFR, GeM, PFMS, Role & Functions of RBI.

F. Fundamental Principles and Basic Concepts of Accounting (45 Marks):

Financial Accounting - Nature and scope, Limitations of Financial Accounting, Basic Concepts and Conventions, Generally Accepted Principles. Basic Concepts of Accounting: Single and Double Entry System, Books of Original Entry, Bank Reconciliation, Journal, Ledgers, Trial Balance, Rectification of Errors, Manufacturing, Trading, Profit & Loss Appropriation Accounts, Balance Sheet, Distinction between Capital and Revenue Expenditure, Depreciation Accounting, Valuation of Inventories, Non-profit making organizations' Accounts, Receipts and Payments, Income & Expenditure Accounts, Bills of Exchange, Self-Balancing Ledgers.

SYLLABUS FOR THE POST OF JUNIOR ADMINISTRATIVE ASSISTANT

PART-I

A. General Intelligence and Reasoning (50 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (50 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (50 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart

D. English Language (50 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

PART-II

Skill Test:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF JUNIOR ENGINEER (AC & R)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Subject knowledge (85 Marks):

General - Knowledge of Indian Electricity Act, Indian Elect. Rules as amended up-to date. General conditions of supply and charges to be paid to licences for obtaining connection. CPWD General Specifications for Electrical Works, Principles of analysis of rates. General Principles in preparation of estimates, project reports, award of works and execution of works and measurement. ISI/BIS Standards and Codes of practices.

Internal Electrical Installations -

Systems of wiring and their design, distribution system. Apparatus for control, protection and Testing.

Earthing, Lighting Protection, Safety & Maintenance -

Necessity of earthing, earthing resistance, type of earthing. Lighting protection design, layout, material and installation. Safety procedures and practices, principles of equipment installation, preventive maintenance and testing of equipment.

Sub-Station up to 33 KV and Distribution -

Layout and Design for indoor and outdoor application. Specifications for equipment, Sub- Station earthlings, stand-by generating sets, commissioning procedures and tests. Distribution: Design of overhead line and underground distribution systems. Specification for cables, conductors, Supports etc. Cable joining and termination methods, power factor improvement, service connection to buildings.

Air-Conditioning Ventilation -

General principles of Refrigeration, Air-conditioning, evaporative cooling and ventilation, Heating and cooling load estimation. Classification of systems, their design and application, structural requirements, specifications for installations.

Water Supply -

Types of pumps and their characteristics. Prime movers, pumping systems and application. Specification for equipment and installation.

ELECTRICAL APPARATUS-

- (i) Single and poly phase A.C. Circuit. Effects of resistance inductance and capacitance.
- (ii) Single and poly phase transformers– constructional features, equivalent circuits performance, parallel operation, phase conversion. Separation of losses and determination of efficiency by various methods. Auto transformers.
- (iii) Alternators, Constructional features, regulation, parallel operation and Protection. Automatic Voltage regulators, Emergency generating sets, automatic change over.
- (iv) Induction machines, polyphasemotor and its principle of operation and equivalent circuit. Torque, slip characteristics. Crawling, methods of starting, single phase motor, its theory, characteristics and application.

INSTRUMENT TRANSFORMERS, PROTECTIVE RELAYING, MEASUREMENTS -

Current, Voltage transformers. Constructional features of IDMT relays, instantaneous relays including knowledge of overload earth fault, undervoltage, Bucholz relays. Connection diagrams, settings. Electrical instruments and Measurements, principles of construction and theory of measuring instruments for direct and alternating currents. Commercial types. Measurement of resistance, Voltage, current, power, power factor and energy. Watt meters, energy meters. Thermos couples, Resistance Thermometers, Pyro-meters. Fault locating bridges for cables. Measurements of resistance, inductance and capacitance, Wheatstone bridge.

INTERNAL COMBUSTION ENGINES

Fuels and Combustion. Fuels and their properties, combustion calculations. Analysis of products of combustion. Power cycles. Vapor power cyclesCarnot and Rankine. Gas Power- Otto and Diesel cycles. Deviation of actual cycles from theoretical cycles. Internal combustion engines – Two and four stroke compression ignition and spark ignition engines. Combustion phenomena. Detonation, Knocking, scavenging of two stroke engines. Fuel injection and carburation. Lubrication and cooling system performance and testing of IC engines. Pollution control requirements/standards.

HEATING, AIR CONDITIONING AND REFRIGERATION

Refrigeration – Refrigeration and heat pump cycles. Vapour compression, absorption Cycles. Refrigerants and their characteristics. Air Conditioning – Psychrometric chart, comfort air-conditioning, comfort indices, ventilation requirements. Cooling and dehumidification methods. Industrial air-conditioning processes. Different methods of electric heating. Construction and performance of Electric heating equipment.

WORKSHOP TECHNOLOGY

Estimation of power and energy requirements of electric welding, different types of equipments used and their characteristics. Manufacturing and fabricating methods and practices for various electrical and mechanical equipment such as pumps, switch boards, light fittings, AHUs etc.

ENERGY CONSERVATION, POWER FACTOR IMPROVEMENT

Comparison of different types of lamps from the point of energy conservation, calculation of payback period. Power factor improvement, Reduction of load current and transformer losses due to power factor improvements. KVA requirement for power factor improvement.

SOLAR ENERGY UTILISATION

Solar Hot Water system, principles, constructional features, constituent parts, installation, operation & maintenance, solar photo voltaic system, advantages/disadvantages of solar heating & solar photo voltaic system.

GENERAL SPECIFICATION OF AIR-CONDITIONING, REFRIGERATION & VENTILATION:-

Execution of installation, drawings and manual, air conditioning equipment, duct work, air handling and treatment, automatic control, general control and monitoring systems, general refrigeration machine, electric motors and electrical equipment noise vibration control, pipe work, valves, cocks and strainers, system monitoring instruments, thermal insulation, unitary air conditioners, water handling equipment, indoor air quality (IAQ), inspection and commissioning, operation and maintenance, painting, finishing and protective treatment.

SYLLABUS FOR THE POST OF JUNIOR ENGINEER (CIVIL)

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Subject knowledge (85 Marks) :

Building Materials : Physical and Chemical properties, classification, standard tests, uses and manufacture/quarrying of materials e.g. building stones, silicate based materials, cement (Portland), asbestos products, timber and wood based products, laminates, bituminous materials, paints, varnishes. **Estimating, Costing and Valuation:** estimate, glossary of technical terms, analysis of rates, methods and unit of measurement, Items of work – earthwork, Brick work (Modular & Traditional bricks), RCC work, Shuttering, Timber work, Painting, Flooring, Plastering. Boundary wall, Brick building, Water Tank, Septic tank, Bar bending schedule, Centre line method, Mid-section formula, Trapezoidal formula, Simpson's rule. Cost estimate of Septic tank, flexible pavements, Tube well, isolates and combined footings, Steel Truss, Piles and pile-caps. **Valuation –** Value and cost, scrap value, salvage value, assessed value, sinking fund, depreciation and obsolescence, methods of valuation.

Surveying : Principles of surveying, measurement of distance, chain surveying, working of prismatic compass, compass traversing, bearings, local attraction, plane table surveying, theodolite traversing, adjustment of theodolite, Levelling, Definition of terms used in levelling, contouring, curvature and refraction corrections, temporary and permanent adjustments of dumpy level, methods of contouring, uses of contour map, tachometric survey, curve setting, earth work calculation, advanced surveying equipment.

Soil Mechanics : Origin of soil, phase diagram, Definitions-void ratio, porosity, degree of saturation, water content, specific gravity of soil grains, unit weights, density index and interrelationship of different parameters, Grain size distribution curves and their uses. Index properties of soils,

Atterberg's limits, ISI soil classification and plasticity chart. Permeability of soil, coefficient of permeability, determination of coefficient of permeability, Unconfined and confined aquifers, effective stress, quick sand, consolidation of soils, Principles of consolidation, degree of consolidation, pre-consolidation pressure, normally consolidated soil, e-log p curve, computation of ultimate settlement. Shear strength of soils, direct shear test, Vane shear test, Triaxial test. Soil compaction, Laboratory compaction test, Maximum dry density and optimum moisture content,

earth pressure theories, active and passive earth pressures, Bearing capacity of soils, plate load test, standard penetration test. Hydraulics :Fluid properties, hydrostatics, measurements of flow, Bernoulli's theorem and its application, flow through pipes, flow in open channels, weirs, flumes, spillways, pumps and turbines.

Irrigation Engineering: Definition, necessity, benefits, 2II effects of irrigation, types and methods of irrigation, Hydrology – Measurement of rainfall, run off coefficient, rain gauge, losses from precipitation – evaporation, infiltration, etc. Water requirement of crops, duty, delta and base period, Kharif and Rabi Crops, Command area, Time factor, Crop ratio, Overlap allowance, Irrigation efficiencies. Different type of canals, types of canal irrigation, loss of water in canals. Canal lining – types and advantages. Shallow and deep to wells, yield from a well. Weir and barrage, Failure of weirs and permeable foundation, Slit and Scour, Kennedy's theory of critical velocity. Lacey's theory of uniform flow.

Definition of flood, causes and effects, methods of flood control, water logging, preventive measure. Land reclamation, Characteristics of affecting fertility of soils, purposes, methods, description of land and reclamation processes. Major irrigation projects in India.

Transportation Engineering: Highway Engineering – cross sectional elements, geometric design, types of pavements, pavement materials – aggregates and bitumen, different tests, Design of flexible and rigid pavements – Water Bound Macadam (WBM) and Wet Mix Macadam (WMM), Gravel Road, Bituminous construction, Rigid pavement joint, pavement maintenance, Highway drainage, Railway Engineering- Components of permanent way – sleepers, ballast, fixtures and fastening, track geometry, points and crossings, track junction, stations and yards. Traffic Engineering – Different traffic survey, speed-flow-density and their interrelationships, intersections and interchanges, traffic signals, traffic operation, traffic signs and markings, road safety.

Environmental Engineering: Quality of water, source of water supply, purification of water, distribution of water, need of sanitation, sewerage systems, circular sewer, oval sewer, sewer appurtenances, sewage treatments. Surface water drainage. Solid waste management – types, effects, engineered management system. Air pollution – pollutants, causes, effects, control. Noise pollution – cause, health effects, control.

Structural Engineering

Theory of structures: Elasticity constants, types of beams – determinate and indeterminate, bending moment and shear force diagrams of simply supported, cantilever and over hanging beams. Moment of area and moment of inertia for rectangular & circular sections, bending moment and shear stress for tee, channel and compound sections, chimneys, dams and retaining walls, eccentric loads, slope deflection of simply supported and cantilever beams, critical load and columns, Torsion of circular section.

General Specification:

General specification of earth work, Cement Contract Work, RCC Work, Brick Work, Stone Work, Wood & PVC Work, Flooring Work, Roofing Work, Finishing Work, Sanitary & Water supply work, Road work, File work, Water proofing treatment, Aluminium work & horticulture work i.e. mode of measurements of all above work.

SYLLABUS FOR THE POST OF JUNIOR ENGINEER (ELECTRICAL)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern –folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (70 Marks):

Basic concepts: Concepts of resistance, inductance, capacitance, and various factors affecting them. Concepts of current, voltage, power, energy and their units.

Circuit law: Kirchhoff's law, Simple Circuit solution using network theorems.

Magnetic Circuit: Concepts of flux, mmf, reluctance, Different kinds of magnetic materials, Magnetic calculations for conductors of different configuration e.g. straight, circular, solenoidal, etc. Electromagnetic induction, self and mutual induction.

AC Fundamentals: Instantaneous, peak, R.M.S. and average values of alternating waves, Representation of sinusoidal wave form, simple series and parallel AC Circuits consisting of R.L. and C, Resonance, Tank Circuit. Poly Phase system – star and delta connection, 3 phase power, DC and sinusoidal response of R-L and R-C circuit.

Measurement and measuring instruments: Measurement of power (1 phase and 3 phase, both active and reactive) and energy, 2 wattmeter method of 3 phase power measurement. Measurement of frequency and phase angle. Ammeter and voltmeter (both moving coil and moving iron type), extension of range wattmeter, Multimeters, Megger, Energy meter AC Bridges. Use of CRO, Signal Generator, CT, PT and their uses. Earth Fault detection.

Electrical Machines : (a) D.C. Machine – Construction, Basic Principles of D.C. motors and generators, their characteristics, speed control and starting of D.C. Motors. Method of braking motor, Losses and efficiency of D.C. Machines. (b) 1 phase and 3 phase transformers – Construction, Principles of operation, equivalent circuit, voltage regulation, O.C. and S.C. Tests, Losses and efficiency. Effect of voltage, frequency and wave form on losses. Parallel operation of 1 phase /3 phase transformers. Auto transformers. (c) 3 phase induction motors, rotating magnetic field, principle of operation, equivalent circuit, torque-speed characteristics, starting and speed control of 3 phase induction motors. Methods of braking, effect of voltage and frequency variation on torque speed characteristics.

Fractional Kilowatt Motors and Single Phase Induction Motors: Characteristics and applications.

Synchronous Machines - Generation of 3-phase e.m.f. armature reaction, voltage regulation, parallel operation of two alternators, synchronizing, control of active and reactive power. Starting and applications of synchronous motors.

Generation, Transmission and Distribution – Different types of power stations, Load factor, diversity factor, demand factor, cost of generation, interconnection of power stations. Power factor improvement, various types of tariffs, types of faults, short circuit current for symmetrical faults.

Switchgears – rating of circuit breakers, Principles of arc extinction by oil and air, H.R.C. Fuses, Protection against earth leakage / over current, etc. Buchholtz relay, Merz-Price system of protection of generators & transformers, protection of feeders and bus bars. Lightning arresters, various transmission and distribution system, comparison of conductor materials, efficiency of different system. Cable – Different type of cables, cable rating and derating factor.

Estimation and costing: Estimation of lighting scheme, electric installation of machines and relevant IE rules. Earthing practices and IE Rules.

Utilization of Electrical Energy: Illumination, Electric heating, Electric welding, Electroplating, Electric drives and motors.

Basic Electronics: Working of various electronic devices e.g. P N Junction diodes, Transistors (NPN and PNP type), BJT and JFET. Simple circuits using these devices.

SYLLABUS FOR THE POST OF JUNIOR HINDI TRANSLATOR

A. General Hindi and Grammar (35 Marks)

B. General English (30 Marks):

General English Questions in this component will be designed to test the Candidate's understanding and knowledge of Hindi & English Languages and will be based on error recognition, fill in the blanks (using verbs, preposition, articles etc.), vocabulary, spellings, grammar, Sentence structure, synonyms, antonyms, sentence completion, correct use of words, phrases and idioms, ability to write language correctly, precisely and effectively.

C. Translation of small paragraphs consisting of 1-2 sentences from Hindi to English and vice versa (35 Marks):

Questions in this part should be designed to test the knowledge of translation.

SYLLABUS FOR THE POST OF JUNIOR MEDICAL RECORD OFFICER

PART-I

A. General Intelligence & Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Basic Computer Knowledge (10 Marks):

- General Computer Processing ability in MS-Office like Word Processing, Excel, Power Point etc. & Operating Systems.
- Professional Software/Hardware System relevant to the Post.
- Any other Computer/IT related questions.

Subject Knowledge (60 Marks):

1. Definition, objectives & functions and classifications of Hospitals.
2. Departmental administration, delegation and decentralization.
3. Departments and service units.
4. Medical Terminology: Elements of medical terms (Roots, prefixes, suffixes, colours, numerals, symbols, abbreviations). Terms related to Investigations, Operations, Treatment of conditions & Disorders.
5. Introduction, Values, Purposes and Uses of Medical Records.
6. Documentation of Records (indexes/ Registers).
7. Birth, Death, Registration and Correction in Record.
8. Medical Ethics and Legal Aspects of Medical Records.
9. International Classification of Diseases (ICD-10) and Related Health Problems.
10. Medical Coding.
11. Electronic Medical Record/ Hospital information System.
12. Contents and Components of Medical Record.
13. Numbering, Filing and Retrieval of Medical Records.
14. Retention, Preservation and Destruction of Medical Records.
15. Accidents registers and wound certificates Legal aspects of hospital-patient, doctor-patient, hospital doctor relationship.
16. Medico-Legal Cases.
17. Hospital Statistics.

PART-II

Skill Test:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF JUNIOR RECEPTION OFFICER

A. General Intelligence & Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Basic Computer Knowledge (10 Marks):

- General Computer Processing ability in MS-Office like Word Processing, Excel, Power Point etc. & Operating Systems.
- Professional Software/Hardware System relevant to the Post.
- Any other Computer/IT related questions.

F. Subject Knowledge (60 Marks):

Principles of Communication and Public Relations

WHAT IS COMMUNICATION?

Definitions – Elements of Communication, Nature, Role and Scope of Communication, Communications, Public opinion and Democracy, Communication mass media and Socio-economic development.

METHODS OF COMMUNICATION:

Face to face Communication, Group Communication, Mass Communication-Spoken, Written, Un-Spoken and Unwritten, Present state of Communication in India.

MASS COMMUNICATIONS AND MASS MEDIA:

Marshal McLuhan's theory-the Medium is the message, One-step, two-step, multi-step flow of Communication, Mass Media and its characteristics

What is Communication research?

The nature and task of Communication research.

PRINCIPLES OF PUBLIC RELATIONS:

What is Public Relations? Meaning and Definitions, Basic elements of PR, Nature, role and scope, PR as a tool of modern management – PR role in the Indian Setting-Developing economy.

PR as distinct from other forms of Communication, PR and Publicity, Lobbying, Propaganda, Sales Promotion, and Advertising, PR and Corporate Marketing Services.

SYLLABUS FOR THE POST OF JUNIOR WARDEN

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (20 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (20 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

SYLLABUS FOR THE POST OF LAB ATTENDANT GRADE II

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

- a. Biomedical Waste Management
 - b. Infection Prevention and Control
 - c. Basic Medical Terms
 - d. Common Laboratory associated Hazards & Bio-safety measures.
 - e. Concept of Quality care in laboratory
 - f. Quality Improvement Tools
 - g. NABH Guidelines
 - h. Basic Biochemistry including Normal values
 - i. HIV, Hepatitis-B and Hepatitis-C, Pre and Post exposure guidelines.
 - j. Medical Ethics
 - k. Basic Anatomy and Physiology
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SYLLABUS FOR THE POST OF LAB TECHNICIAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

Biochemistry –

- Cleaning and care of general laboratory glass ware and equipment. Types of pipettes, calibration of pipettes.
- Distilled water. Method of preparation and storage of distilled water. Type of water distillation plants.

- Preparation of solutions – units of weights and volume, Calculation of concentration and methods of expressing concentration of solution.
- Units of Measurement - S.I unit and CGS units. Normality, Molarity, Molality
- Calibration of volumetric apparatus
- Principle, working and maintenance of Analytical balance
- Quality control and quality assurance in a clinical biochemistry laboratory
- Laboratory organization, management and maintenance of records
- Principles of assay procedures, Normal range in blood, Serum, Plasma and Urine and reference values.
- pH – Definition, Henderson Hasselbach equation, Pka value, pH indicator, Methods of measurement of pH, pH paper, pH meter, Principle, working, maintenance and calibration of pH meter
- Volumetric analysis- Normal and molar solutions, Standard solutions, Preparation of reagents, Storage of chemicals
- Working principles Types and applications of Electrophoresis – Paper, Agarose Gel, Cellulose Acetate and PAGE.
- Working principles, types and applications of Chromatography - Paper Chromatography, TLC, Ion Exchange, Affinity Gel, Filtration, Gas Chromatography and HPLC.
- Working principles, types and application of centrifugation
- Working Principles and application of photometry, and atomic absorption, Spectrophotometry and colorimetry.
- Definition, basic concepts of classification mechanism of action and properties of enzymes, factors influencing enzyme action
- Basic and elementary concepts of chemistry and properties of carbohydrates as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of carbohydrates – Methods for determining glucose, ketones, lactate, pyruvate reducing sugars and mucopolysaccharides and their clinical significance. Biochemistry, types, criteria parameters in diagnosis and prognosis of Diabetes mellitus.
- Basic and elementary concepts of chemistry and properties of lipids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of lipid. Importance of lipids in the body in body basic metabolic aspects and analytical importance. Disorders of lipid metabolism. Lipoproteins patterns in disease – analytical methods and procedures applicable to detecting and monitoring such disorders.
- Basic and elementary concepts of chemistry and properties of proteins & amino acids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of amino acids and proteins – current methodologies for their determination and identification in biological specimens – disease associated with alteration in or deficiencies of amino acids and proteins.
- Basic and elementary concepts of chemistry and properties of nucleic Acids as applicable to the human body.
- Basic concepts of principles of nutrition and nutrients macro and micro nutrients. Vitamins & Minerals. Vitamins- Fat soluble vitamins , Water soluble vitamins sources, Biochemical role, RDA, deficiency manifestations Minerals – Calcium, Phosphorous, Iron, Copper, Zinc, Magnesium, Manganese, Iodine.
- Analytical methods and recommendations for testing and assessing nutritional deficiency – Methods for assessing concentration of vitamins in biological samples.
- General requirements for laboratory assessment of trace elements including specimen collection, handling, selection of analytical methodology and establishing quality.
- Overview of Biochemical roles of major electrolytes and blood gases and their changes in pathological states – relationship between major electrolytes and acid base balance –

- application of physical and chemical principles to biological system – laboratory measurements of electrolytes and blood gases. Acid base balance disorders
- Overview of current concepts in endocrinology RIA, ELISA, chemiluminescence assay procedure for hormones – physiological effects produced by normal and abnormal levels of various hormones. Thyroid function test and Adrenal function test.
 - Introduction to molecular Biology. Recombinant DNA technology, Role of recombinant DNA technology as diagnostic tool. Polymerase chain reaction.
 - Overview of porphyrins, their precursors, primary and secondary disorders of porphyrin metabolism – diagnostic laboratory methodologies including appropriate specimen collection and preservation techniques related to porphyrins
 - Laboratory tests and analytical methods used in identification and evaluation of hepatobiliary disorders, renal disorders and disorders of Stomach, pancreas and intestinal tract
 - Overview of calcium and inorganic phosphate metabolism current laboratory analytical

Microbiology –

- History of Medical Microbiology - Host-Microbe relationship.
- Safety Measures in clinical microbiology
- Cleaning, care and handling of glassware
- Care and maintenance of Equipment in Microbiology.
- Microscopy: Principle, types and uses of microscope
- Sterilization and Disinfection - Definition, Types, principles, mode of action and methods. Qualities of a good disinfectant. Assay for various disinfectants .
- Biomedical waste management in a lab
- General characteristics & classification of Microbes : Classification of microbes. Morphological classification of bacteria, Bacterial anatomy (Bacterial cell structures)
- Growth and nutrition of bacteria, Culture media and culture methods-aerobic and anaerobic
- Quality control and safety in microbiology.
- Handling and care of laboratory animals.
- Antimicrobial agents, Antimicrobial susceptibility tests.
- Stains used in bacteriology Principle, procedures, significance and interpretation - Simple staining, Gram stain, Ziehl –Neelsen staining, Albert’s stain, Capsule staining.
- Principle, procedures and interpretation of the biochemical tests for identification of different bacteria.
- Immunity – innate and acquired immunity, humoral and cell mediated.
- Antigen antibody reactions and their applications
- Complement
- Hypersensitivity
- Vaccines
- Gram positive & Gram negative cocci – Staphylococci, Streptococci, Enterococci, Pneumococci, Neisseria
- Gram positive bacilli – Corynebacterium, Mycobacterium, Actinomyces, Listeria, Bacillus, Clostridia
- Gram negative bacilli – Enterobacteriaceae, Pseudomonas, Vibrio, Aeromonas, Plesiomonas, Campylobacter, Bacteroides, Fusobacterium, Brucella, Haemophilus, Bordetella, Pasteurella, Francisella
- Spirochaetes, Chlamydia, Rickettsia, Mycoplasma, L forms
- General properties of viruses – Structure, classification and replication.
- Laboratory diagnosis of virus
- DNA virus –Adenovirus, Papova virus, Herpes virus, Varicella zoster virus, Cytomegalo virus, Hepatitis B virus
- RNA virus – Polio virus, Influenza virus, Para influenza virus, Mumps virus, Measles virus, Rubella virus, Respiratory syncytial virus, Rhinovirus, Rotavirus, Hepatitis virus, Arbo viruses

prevalent in India (Dengue, West Nile, Japanese Encephalitis, KFD), HIV, Rabies virus, SARS virus.

- Bacteriophage
- Introduction to Parasitology –Common definitions, Types and Classification of parasites.
- Collection transport and preservation of specimens for parasitological examination
- Protozoa: Entamoeba Trichomonas, Trypanosomes, Leishmania, Giardia, Plasmodium, Isospora, Balantidium, and Toxoplasma.
- Cestodes - Diphylobothrium, Taenia, Echinococcus, Hymenolepis.
- Trematodes - Schistosoma, Fasciola, Fasciolopsis, Clonorchis, Paragonimus
- Intestinal Nematodes - Ascaris, Ancylostoma, Necator, Strongyloides, Trichinella Enterobius, Trichuris
- Tissue Nematodes - Wucherei, Brugia, Loa loa, Onchocerca, Dracunculus
- Collection and preservation of specimens for parasitological examination, preservation of specimens of parasitic eggs and embryos, Preserving Fluids, Transport of specimens.
- Morphology and classification of fungus
- Laboratory diagnosis of fungus- Culture media used in mycology, Direct microscopy in Medical mycology laboratory, Processing of clinical samples for diagnosis of fungal infections i.e. Skin, nail, hair, pus, sputum, CSF and other body fluids.
- Superficial fungal infections
- Subcutaneous fungal infections
- Deep fungal infections
- Opportunistic fungal infections
- Techniques used for isolation and identification of medically important fungi
- Methods for identification of yeasts and moulds
- Preservation of fungal cultures

Pathology –

- General-Haematology: Origin, development, morphology, maturation, function and fate of blood cells, nomenclature of blood cells.
- Various methods of blood collection, anticoagulants-mechanism and uses.
- Basic concepts of automation in haematology
- Counting chamber- hemocytometry. Enumeration of RBC including various counting chambers, diluting fluids for RBC count.
- Haemoglobinometry. Principles and methods of quantitating Hb. Concentration of blood including knowledge of errors and quality control in various method. Abnormal hemoglobin and its investigation.
- ESR: introduction, factors affecting ESR, principles and methods of determining ESR, increasing and decreasing conditions of ESR.
- WBC: introduction, development of WBC, diluting fluids. Absolute eosinophil count, errors in sampling, mixing, diluting and counting.
- Cell counting, advantages and disadvantages, uses and mechanism of cell counting, quality control in cell counts.
- Preparation of peripheral smear and bone marrow smear. Thin smear, thick smear. Buffy coat smear, wet preparation. Romanowsky stain. Preparation advantages and disadvantages.
- Principle and methods of staining of Blood smears and bone marrow smears. Supravital stain. Reticulocyte count. Heinz bodies.
- Description of morphology of normal and abnormal red cells. Blood differential WBC counting. Recognition of abnormal cell. Anaemia – definition etiology classification and laboratory diagnosis.
- Methods of identification and estimation of abnormal hemoglobin including spectroscopy. HB electrophoresis. Alkali denaturation Test. Sick cell preparation.

- Various benign leucocyte reaction – Leukocytosis. Neutrophilia, Eosinophilia, Lymphocytosis. Infectious mononucleosis. leucopenias.
- Leukemias – definition, causes, classification, detection of leukemia. Total leucocyte count in leukemias. Multiple myeloma.
- Blood Coagulation and disorders of hemostasis. Classification of coagulation factors, Principles and methods of assessment of coagulation. BT, CT, Prothrombin time, partial thromboplastin time, thromboplastin regeneration time
- Thrombocytopenia, thrombocythemia, platelet function test, platelet count. Clot retraction test. Platelet factor III Test.
- LE cell – definition, morphology causative agents. Various methods of demonstrating LE cells. Blood parasites. Malaria, LD bodies, microfilaria and methods of demonstration.
- Preparation of donor and collection of blood. Solution and apparatus used. Storage of blood. Preparation and storage of plasma. Preparation of packed red cells.
- Principles involved in Blood grouping. ABO system and the methods used. Factors influencing the results of blood grouping, Rh system. Rh antigen. Principles and methods used.
- Cross matching. Compatibility test, direct and indirect Coomb's test – Principle involved and the methods used. Blood transfusion and its Hazards.
- Definition, sources and types histological specimens, kinds of histological presentations
- Labelling, fixation, properties of fixing fluids, classification and composition of fixing fluids. Advantages and disadvantages of secondary fixatives. Post chroming.
- Tissue processing, dehydration and cleaning.
- Embedding. Water soluble substances, embedding in paraffin nitrocellulose
- Equipment for sectioning microtome, knife, honing and stropping. Types, care and use of microtome.
- Technique for sectioning – frozen section. Technique for sectioning – Paraffin embedded tissue. Errors in sectioning and remedies. Attaching blocks to carriers.
- Technique of processing bone for histological studies. Mounting and covering. Mounting media.
- Staining – theory, types of staining agent. Mordents and differentiation. H & E staining. Types of hematoxylin and its preparation. Eosin stock stain and other counter stain used.
- Demonstration of collagen, reticulin, elastin, fat, amyloid, glycogen, mucin, pigments and minerals (malarial, mercury, bile, lipofuscin, calcium, iron, copper).
- Principles of histochemistry and its application
- Demonstration of neuron, neuroglia, myelin and axon. Processing of eye ball for histology.
- Demonstration of fat, iron, amyloid, bile in large sections of tissue.
- Cytology – introduction, definition, types of cytological specimen, preparation of slide for microscopic studies, stains used.
- Museum technique. Preparation, setting up of and arrangement of museum.
- Preparation of cell blocks, mailing of slides.
- FNAC, definition, techniques involved in preparation of smear and staining. PAP smear.
- Calibration and Validation of Clinical Laboratory instruments

SYLLABUS FOR THE POST OF LIBRARIAN GRADE III

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (Library methods and techniques) (60 Marks):

Library Methods and Techniques Library and Society: Laws of Library Science; Types of Libraries; Library Associations, Systems and Programmers; Library Movement and Library Legislation in

India; Organizations and Institutions involved in the development of Library and Information Services-UNESCO, IFLA, FID, INIS, NISSAT, etc.

Library Management: Collection development - Types of Documents and Selection Principles, Acquisition Procedure, Acquisition of Journals and Periodicals, Preparation of Documents for use; Library Personnel and Library Committee, Library Rules and Regulations; Library Finance and Budget; Principles of Library Management, Library Organization and Structure; Use and Maintenance of the Library - Circulation, Maintenance, Shelving, Stock Verification, Binding and Preservation, Weeding out, etc.; Library Classification Theory and Practice: Canons and Principles, Library Classification Schemes- DDC, CC, UDC; Library Cataloguing Theory and Practice: Canons and Principles; Library Cataloguing Codes - CCC and AACR; Reference and Information Sources: Bibliography and Reference Sources Types of Bibliography; Reference Sources- Dictionaries, Encyclopaedias, Ready Reference Sources, etc.; Sources of Information - Primary, Secondary, Tertiary, Documentary, Non-Documentary; E-Documents, EBooks, E-Journals, etc.; Information Services: Concept and need for Information; Types of Documents; Nature and organization of Information Services, Abstracting and Indexing Services; Computer based Information Services - CAS, SDI; Information Technology: Basics Introduction to Computers; Use of computers in Library housekeeping, Library Automation; Software and software packages; Networks DELNET, NICNET, etc.; National and International Information Systems NISSAT, NASSDOC, INSDOC, DESIDOC, etc.

SYLLABUS FOR THE POST OF LINEMAN (ELECTRICAL)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.
- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation

- **Magnetism:** Classification of magnetic properties, Para, dia and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

SYLLABUS FOR THE POST OF MANAGER/SUPERVISOR/GAS OFFICER

Subject Knowledge (100 Marks):

A. Respiratory Anatomy and Physiology (10 Marks):

- Structure and function of the respiratory tract Nose - Role in humidification
- Pharynx - Obstruction in airways Larynx - Movement of vocal cords, Cord palsies.
- Trachea & Bronchial tree - vessels, nerve supply, respiratory tract, reflexes, bronchospasm
Alveoli - Layers, Surfactants
- Respiratory Physiology
- Control of breathing
- Respiratory muscles- diaphragm, intercostal
- Lung volumes - dead space, vital capacity, FRC etc.
- Pleural cavity - intrapleural pressure, pneumothorax.
- Work of breathing - airway resistance, compliance
- Respiratory movements under anaesthesia.
- Tracheal tug - signs, hiccup

B. Pulmonary Gas exchange and disorders (10 Marks):

- Pulmonary Gas Exchange and Acid Base Status
- Pulmonary circulation - Pulmonary oedema, pulmonary hypertension • Pulmonary function tests.
- Transfer of gases - Oxygen & Carbon dioxide
- Acid base status, definitions, acidosis types, Alkalosis types, buffers in the body.
- Oxygen: properties, storage, supply, hypoxia
- Respiratory failure, type, clinical features, causes.

C. Cardiac Anatomy and Physiology (10 Marks):

- Cardiovascular System
- Anatomy - Chambers of the heart, major vasculature.
- Coronary supply, innervations, Conduction system Cardiac output - determinants, heart rate, preload, after load.
- Coronary blood flow & myocardial oxygen supply
- ECG - arrhythmias cardiovascular response to anaesthetic & surgical procedures.

D. Clinical Pharmacology of Oxygen and Oxygen delivery (10 Marks):

- Hypotension- causes, effects, management.
- Cardio pulmonary resuscitation.
- Myocardial infarction, hypertension.
- Gases - O₂, N₂O, Air
- Gas properties and safety:
- the hazards of compressed and cryogenic gases;
- cylinder colours and labelling;
- actions on finding defective cylinders;
- operation of cylinder valves;
- cylinder storage and handling (medical gas/pathology gas stores)
- Preparation of cylinders for use;
- Selection of appropriate equipment and its connection and disconnection to/from cylinders respectively.

E. Anaesthesia Machine (10 Marks):

- Hanger and yoke system
- Cylinder pressure gauge
- Pressure regulator
- Flow meter assembly
- Vapourizers - types, hazards, maintenance, filling and draining, etc.
- General considerations: humidity & heat
- Common components - connectors, adaptors, reservoir bags.
- Capnography ; ET CO₂
- Pulse oximetry
- Methods of humidification

F. Breathing systems (10 Marks):

- Classification of breathing system
- Mapleson system
- Jackson Rees system, Bain circuit
- Non rebreathing valves - AMBU valves
- The circle system Components Soda lime, indicators

G. Gas Distribution Systems (10 Marks):

- Compressed gas cylinders
- Colour coding
- Cylinder valves; pin index
- Gas piping system
- Recommendations for piping system
- Alarms & safety devices

H. MGPS Design and Techniques (10 Marks):

- Statutory obligations and safe system operation
- MGPS design and installation requirements
- Basic fault-finding
- Structure and management of the permit-to work system
- MGPS equipment performance requirements (plant and pipeline) Technical reporting including system capacities/ limitations, upgrading requirements/equipment replacement, system compliance

I. MGPS Policies and documentation (10 Marks):

- MGPS documentation
- Emergency procedures
- MGPS operational policy preparation, implementation and monitoring
- MGPS testing and quality control requirements
- Manifold systems
- Cryogenic liquid cylinders
- Bulk cryogenic (VIE) systems
- Alarm requirements

J. Miscellaneous Systems (10 Marks)

SYLLABUS FOR THE POST OF MANIFOLD ROOM ATTENDANT

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (20 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (20 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (20 Marks):

1. Gas Distribution Systems: Compressed gas cylinders, Colour coding, Cylinder valves; Pin index, Gas piping system, Recommendations for piping system, Alarms & safety devices.
2. MGPS Design and Techniques: Statutory obligations and safe system operation, MGPS design and installation requirements, Basic fault-finding, Structure and management of the permit-to work system, MGPS equipment performance requirements (plant and pipeline); Technical reporting including system capacities/limitations, upgrading requirements/equipment replacement, system compliance.

3. MGPS Policies and documentation: MGPS documentation; Emergency procedures; MGPS operational policy preparation, implementation and monitoring; MGPS testing and quality control requirements; Manifold systems; Cryogenic liquid cylinders; Bulk cryogenic (VIE) systems Alarm requirements.
4. Piping materials and specification of W.I. & steel pipes, Pipe threads, Pipe fittings, Specifications of fittings, Brief description of different types of pipe joints, Pipe fittings, Flanges, Unions, Valves etc., Different types of pipes lay out systems, Different types of pipe joint
5. Working principals of valves and their description.
6. Mechanical faults on terminal outlets, Line regulators, Zone valve boxes and faults on electrically controlled line, Pressure alarms.
7. Oxygen acetylene welding procedure of medical gas pipeline using inert gas shielding
8. Installation, maintenance and repair of liquid oxygen plant and high-pressure cylinder manifolds
9. Types of many gas manifolds.
10. Manifolds selection criteria.
11. Manifolds assemblies.
12. Semi- automatic manifolds.
13. Manifolds accessories.
14. Manifolds valves etc.

SYLLABUS FOR THE POST OF MANIFOLD TECHNICIAN

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (60 Marks):

1. Gas Distribution Systems: Compressed gas cylinders, Colour coding, Cylinder valves; Pin index, Gas piping system, Recommendations for piping system, Alarms & safety devices.
2. MGPS Design and Techniques: Statutory obligations and safe system operation, MGPS design and installation requirements, Basic fault-finding, Structure and management of the permit-to work system, MGPS equipment performance requirements (plant and pipeline); Technical reporting including system capacities/limitations, upgrading requirements/equipment replacement, system compliance.

3. MGPS Policies and documentation: MGPS documentation; Emergency procedures; MGPS operational policy preparation, implementation and monitoring; MGPS testing and quality control requirements; Manifold systems; Cryogenic liquid cylinders; Bulk cryogenic (VIE) systems Alarm requirements.
4. Piping materials and specification of W.I. & steel pipes, Pipe threads, Pipe fittings, Specifications of fittings, Brief description of different types of pipe joints, Pipe fittings, Flanges, Unions, Valves etc., Different types of pipes lay out systems, Different types of pipe joints.
5. Working principals of valves and their description.
6. Mechanical faults on terminal outlets, Line regulators, Zone valve boxes and faults on electrically controlled line, Pressure alarms.
7. Oxygen acetylene welding procedure of medical gas pipeline using inert gas shielding
8. Installation, maintenance and repair of liquid oxygen plant and high-pressure cylinder manifolds
9. Types of many gas manifolds.
10. Manifolds selection criteria.
11. Manifolds assemblies.
12. Semi- automatic manifolds.
13. Manifolds accessories.
14. Manifolds valves etc.

SYLLABUS FOR THE POST OF MATERNITY AND CHILD WELFARE OFFICER

Subject Knowledge (100 Marks):

A. Basic Sciences (10 Marks):

- Describe the anatomical and biochemical structures so as to explain the physiological functions of human body and factors, which may disturb these, and mechanism of such disturbances.
- Describe various groups of micro-organisms of clinical importance.
- Identify and take appropriate measures including disinfection and sterilization for the prevention of diseases in the hospital and community.
- Collect and handle specimens for various diagnostic tests.
- Enumerate weights and measures and demonstrate skill in calculation of dosage and preparation of solutions.
- Read and interpret prescriptions and care for drugs according to the regulations.
- Describe various groups of drugs acting on different systems of the body.
- Recognize the toxic symptoms related to common drugs and poisons.

B. Nutrition and Dietetics (10 Marks):

- Describe various nutrients and their importance in the maintenance of health.
- Plan diets suitable to socioeconomic status for different age groups and physiological conditions.
- Detect nutritional deficiencies and explain their prevention and management.
- Plan therapeutic diets for various disease conditions.

C. Psychology, Mental Health and Psychiatric Nursing (10 Marks):

- Describe normal and deviations in behaviour among various age groups and their cause.
- Explain the principles of psychology and its application in health and diseases.
- Interpret behaviour of self and others.
- Recognize deviations from normal behaviour and provide guidance and counselling.
- Explain the dynamics of patient's behaviour and its application in providing nursing care.
- Demonstrate skill in communication and maintain interpersonal relations.
- Describe various therapies utilized in psychiatry and the various roles of nurses in psychiatric nursing.

D. Fundamentals of Nursing (10 Marks):

- Describe nursing as a profession, its scope, etiquettes & ethics.
- Provide first aid treatments.
- To provide congenial and safe environment to the patient.
- Carry out basic nursing procedures for the care of the patients with an understanding of the scientific principles involved.
- Make accurate observations and records.
- Administer prescribed medications and carry out treatments.
- Maintain records of patients and nursing care.

E. Community Health Nursing and Family Welfare Programs (10 Marks):

- Describe personal, environmental, social and cultural factors contributing to health of individual, family and community.
- Explain methods of control of spread of diseases.
- Identify the needs for health education and impart and evaluate the effect of the same to patients, families and community.
- Prepare and use appropriate audio-visual aids for imparting health education.
- Recognize symptoms of social disorganization and social pathology.
- To demonstrate skills in medico-social work.

- Explain the principles of health care to mothers and children and the services available for them in urban and rural communities.
- Identify deviations from normal amongst mother and children and take necessary action in clinics, health centres and homes.
- Educate the community about need and methods of family planning.
- Demonstrate skill in community diagnosis and in delivery of community nursing services in accordance with the national health care system.

Medical and Surgical Nursing (20 Marks):

- Explain the causes, pathophysiology, symptoms, treatment and prophylactic measures in common medical and surgical conditions affecting various systems of the body.
- Provide patient centred nursing care to patients with common medical and surgical conditions affecting various systems of the body.
- Prepare operation theatre for surgery and assist in operative procedures.
- Identify common equipment used in operation theatre
- Explain the anaesthesia used, with their effects and dangers, and care for an anesthetized patient until such time as he recovers from the effect of anaesthesia.
- Recognize and provide first aid in case of common emergencies using the resuscitation equipment including intubation. Care for critically ill patients who required support for maintaining vital functions. Provide first aid in case of disaster, emergency and accidents and demonstrate skill in transporting the casualties. Organize casualty/emergency services.

G. Paediatric Nursing (10 Marks):

- Describe growth and development, nutritional and psychological needs of children at different age group.
- Explain basic principles involved in paediatric nursing.
- Provide nursing management to neonates and children with medical and surgical disorders.
- Recognize emergencies in neonates and children and take appropriate first aid measures.
- Manage normal new born and low birth weight baby.
- Describe various aspects of preventive paediatric nursing and be able to practice them while rendering nursing care in a hospital or community.

H. Obstetrical Nursing (10 Marks):

- Explain anatomy and physiology of pregnancy, child-birth and puerperium.
- Provide antenatal care to mothers.
- Conduct normal delivery independently in a hospital and community and recognize abnormalities and make timely referral to doctor.
- Perform episiotomy and suture a first and second -degree tear.
- Guide and supervise multipurpose workers to carry on domiciliary services to mothers and children
- Describe the management of common obstetrical emergencies needing immediate treatment.
- Provide family welfare advice.

I. Principles of Administration and Supervision, Education and Trends in Nursing (10 Marks):

- Explain the principles of administration and its application to health administration at different levels.
- Describe the organizational pattern for nursing components of hospital and public health service.
- Maintain effective human relations to improve efficiency of the staff.
- Describe the principles of supervision and develop skill in supervisory techniques.
- Explain the trends in nursing and nursing education in India and abroad.
- Appreciate the emergence of nursing as a profession and the rights, responsibilities and adjustment in professional life.
- Use different methods of teaching applicable to nursing.

SYLLABUS FOR THE POST OF MECHANIC (AIR CONDITIONING & REFRIGERATION)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject knowledge (40 Marks):

General - Knowledge of Indian Electricity Act, Indian Elect. Rules as amended up-to date. General conditions of supply and charges to be paid to licences for obtaining connection. CPWD General Specifications for Electrical Works, Principles of analysis of rates. General Principles in preparation of estimates, project reports, award of works and execution of works and measurement. ISI/BIS Standards and Codes of practices.

Internal Electrical Installations -

Systems of wiring and their design, distribution system. Apparatus for control, protection and Testing.

Earthing, Lighting Protection, Safety & Maintenance -

Necessity of earthing, earthing resistance, type of earthing. Lighting protection design, layout, material and installation. Safety procedures and practices, principles of equipment installation, preventive maintenance and testing of equipment.

Sub-Station up to 33 KV and Distribution -

Layout and Design for indoor and outdoor application. Specifications for equipment, Sub- Station earthlings, stand-by generating sets, commissioning procedures and tests. Distribution: Design of overhead line and underground distribution systems. Specification for cables, conductors, Supports etc. Cable joining and termination methods, power factor improvement, service connection to buildings.

Air-Conditioning Ventilation -

General principles of Refrigeration, Air-conditioning, evaporative cooling and ventilation, Heating and cooling load estimation. Classification of systems, their design and application, structural requirements, specifications for installations.

Water Supply -

Types of pumps and their characteristics. Prime movers, pumping systems and application. Specification for equipment and installation.

ELECTRICAL APPARATUS-

- (i) Single and poly phase A.C. Circuit. Effects of resistance inductance and capacitance.
- (ii) Single and poly phase transformers— constructional features, equivalent circuits performance, parallel operation, phase conversion. Separation of losses and determination of efficiency by various methods. Auto transformers.
- (iii) Alternators, Constructional features, regulation, parallel operation and Protection. Automatic Voltage regulators, Emergency generating sets, automatic change over.
- (iv) Induction machines, polyphasemotor and its principle of operation and equivalent circuit. Torque, slip characteristics. Crawling, methods of starting, single phase motor, its theory, characteristics and application.

INSTRUMENT TRANSFORMERS, PROTECTIVE RELAYING, MEASUREMENTS -

Current, Voltage transformers. Constructional features of IDMT relays, instantaneous relays including knowledge of overload earth fault, undervoltage, Bucholz relays. Connection diagrams, settings. Electrical instruments and Measurements, principles of construction and theory of measuring instruments for direct and alternating currents. Commercial types. Measurement of resistance, Voltage, current, power, power factor and energy. Watt meters, energy meters. Thermos couples, Resistance Thermometers, Pyro-meters. Fault locating bridges for cables. Measurements of resistance, inductance and capacitance, Wheatstone bridge.

INTERNAL COMBUSTION ENGINES

Fuels and Combustion. Fuels and their properties, combustion calculations. Analysis of products of combustion. Power cycles. Vapor power cycles Carnot and Rankine. Gas Power- Otto and Diesel cycles. Deviation of actual cycles from theoretical cycles. Internal combustion engines – Two and four stroke compression ignition and spark ignition engines. Combustion phenomena. Detonation, Knocking, scavenging of two stroke engines. Fuel injection and carburation. Lubrication and cooling system performance and testing of IC engines. Pollution control requirements/standards.

HEATING, AIR CONDITIONING AND REFRIGERATION

Refrigeration – Refrigeration and heat pump cycles. Vapour compression, absorption Cycles. Refrigerants and their characteristics. Air Conditioning – Psychrometric chart, comfort air-conditioning, comfort indices, ventilation requirements. Cooling and dehumidification methods. Industrial air-conditioning processes. Different methods of electric heating. Construction and performance of Electric heating equipment.

WORKSHOP TECHNOLOGY

Estimation of power and energy requirements of electric welding, different types of equipments used and their characteristics. Manufacturing and Fabricating methods and practices for various electrical and mechanical equipment such as pumps, switch boards, light fittings, AHUs etc.

ENERGY CONSERVATION, POWER FACTOR IMPROVEMENT

Comparison of different types of lamps from the point of energy conservation, calculation of payback period. Power factor improvement, Reduction of load current and transformer losses due to power factor improvements. KVA requirement for power factor improvement.

SOLAR ENERGY UTILISATION

Solar Hot Water system, principles, constructional features, constituent parts, installation, operation & maintenance, solar photo voltaic system, advantages/disadvantages of solar heating & solar photo voltaic system.

GENERAL SPECIFICATION OF AIR-CONDITIONING, REFRIGERATION & VENTILATION:-

Execution of installation, drawings and manual, air conditioning equipment, duct work, air handling and treatment, automatic control, general control and monitoring systems, general refrigeration machine, electric motors and electrical equipment noise vibration control, pipe work, valves, cocks and strainers, system monitoring instruments, thermal insulation, unitary air conditioners, water handling equipment, indoor air quality (IAQ), inspection and commissioning, operation and maintenance, painting, finishing and protective treatment.

SYLLABUS FOR THE POST OF MECHANIC (E&M)

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (Electrical) (20 Marks):

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.
- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.

- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, dia and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len's law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

F. Subject Knowledge (Mechanical) (20 Marks):

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.
- Conservation of Energy
- Engineering Materials
- Mechanics of Solids
- Workshop Technology
- Hydraulics and Pneumatics
- Theory of Machines
- Preventive Maintenance of machines
- Design and Estimation
- Production Technology
- Advanced Manufacturing Processes
- Industrial Engineering and Safety
- Metrology and Measuring Instruments
- Repair and Maintenance
- Disaster Management and Safety
- Introduction of fitting trade. Marking tools; callipers Dividers, Surface plates, Angle plates, Scribes, punches, surface gauges Types, Uses, Care and maintenance. Use of different bench tools used by sheet metal worker. Description and types of taps and dies, Description of marking and cutting tools such as snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Types of rivets and riveted joints. Use of thread gauge. Different types of threads. Materials, fluxes and process. Care and maintenance of tools. Introduction to thermometers, pressure gauges etc.

SYLLABUS FOR THE POST OF MEDICAL OFFICER AYUSH (YOGA)

Subject Knowledge (100 Marks):

1.1 Introduction to Yoga and Yogic practices

- Etymology of Yoga and definitions of Yoga in different Classical Yoga texts
- Brief introduction to origin, history and development of Yoga
- Aim, Objectives and Misconceptions about Yoga
- General Introduction to *Shad-darshanas* with special reference to *Sankhya* and Yoga
- General introduction to four paths of Yoga
- Principles of Yoga and Yogic practices
- Guidelines for Instructors

1.2 Introduction to Hatha Yoga

- Distinction between Yoga Asana and Non-Yogic physical practices
- Introduction to important Hatha Yoga Texts with special reference to Hatha Yoga Pradipika and Gheranda Samhita
- Concept of Yogic Diet
- Causes of Success (*Sadhaka Tattwa*) and Causes of Failure (*Badhaka Tattwa*) in Hatha Yoga *Sadhana*
- Concept of *Ghata* and *Ghata Shudhhi* in Hatha Yoga
- Purpose and utility of *Shat-kriya* Hatha Yoga
- Purpose and utility of Asana in Hatha Yoga
- Purpose and importance of *Pranayama* in Hatha Yoga

1.3 Introduction to Patanjali

- Definition, nature and aim of Yoga according to Patanjali
- Concept of *Chitta* and *Chitta Bh umis*
- *Chitta-vrittis* and *Chitta-vrittinirodhopaya* (*Abhyasa* and *Vairagya*)
- Concept of *Ishwara* and *Ishwara Pranidhana*
- *Chitta Vikshepas* (*Antarayas*) and their associates (*Saiibhuva*)
- Concept of *Chitta Prasaduna* and their relevance in mental well being
- *Kleshas* and their significance in Yoga
- Ashtanga Yoga of Patanjali : its purpose and effects, its significance

2.1 Introduction to human systems, yoga and health

- The nine systems of human body
- Functions of different systems of human body
- Introduction to Sensory Organs
- Neuromuscular co-ordination of Sensory Organs
- Basic understanding of Exercise Physiology
- Homeostasis
- The benefits of various *asana* on different parts of the human body
- The limitations and contra-indications of specific Yoga practices

2.2 Yoga for wellness- prevention and promotion of positive health

- Health, its meaning and definitions
- Yogic conceptions of health and diseases
- Concept of Pancha kosha
- Concept of Triguna
- Concept of Yogic principles of Healthy-Living
- Introduction to yogic diet and nutrition

2.3 Yoga and stress management

- Human Psyche: Yogic and modern concepts, Behavior and Consciousness
- Frustration, Conflicts, and Psychosomatic disorders
- Relationship between Mind and Body
- Mental Hygiene and Roll of Yoga in Mental Hygiene
- Mental health: a Yogic perspective
- Prayer and meditation for mental health
- Psycho-social environment and its importance for mental health (yama, and niyama)
- Concept of stress according to modern science and Yoga
- Role of Yoga in Stress management
- Role of Yoga for Life management

3.1 The movement of key joints of the body and the demonstrated ability to perform the same — Neck, Shoulder, Trunk, Knee, Ankle 5

3.2 *Sukshma Vyayama and Shat Karma*

Neti, Dhauti , Kapalabhati , Agnisaar, Kriya , Trataka

Surya Namaskar and Asana:

4.1 *Suryanamaskar* (Sun Salutation)

a. Knowledge and Demonstration ability to perform *Suryanamaskar*

4.2 *Asana:*

a. Knowledge of upto basic postures as below and demonstrated ability to perform these postures.

- *Saravangasana* (shoulderstand)
- *Halasana* (plough)
- *Matsyasana* (fish)
- *Paschimottanasana* (sitting forward bend)
- *Bhujangasana* (cobra)
- *Salabhasana* (locust)
- *Dhanurasana* (bow)
- *Ardh matsyendrasana* (half spinal twist)
- *Kakasana* or *bakasana* (crow)
- *Padahasthasana* (standing forward bend)
- *Trikonasana* (triangle)

b. Knowledge of another five *asanas* chosen by the applicant and demonstrated ability to perform the same.

c. Knowledge of the Sanskrit names of the postures and breathing exercises, detailed benefits and caution.

d. Knowledge of the five spinal movements — inverted, forward, backward, lateral twist and lateral bend and neutral positions of the spine

e. Knowledge of 360 degree, all round, Yogic exercise through the practice of *asanas*, proper relaxation, proper breathing, contra-indications, cautions and medical considerations; obvious and subtle benefits; and modification in basic postures to accommodate limitations

Pranayama and Practices leading to Meditation

5.1 *Pranayama*

- a. Familiarity with and Demonstrated ability to perform abdominal (and diaphragmatic), thoracic, clavicular breathing and the full Yogic breath.
- b. Familiarity with and Demonstrated ability to perform *Anuloma Viloma, Bhastrika, Chandrabhedha, Suryabhedhana, Ujjayi, Bhramari, Sheetal, Sheetkari*, and the knowledge of its benefits, limitation and applications.

5.2 *Practices leading to Meditation*

- a. Familiarity with and Demonstrated ability to perform *Dharana* and *Dhyana* and to demonstrate allied practices like *Madras, Mantra Japa*.
- b. Familiarity with the concept of environment for meditation and the benefits of meditation on health and well-being and its practical application in modern life.

Teaching Practice

6.1 Knowledge of

- a. The scope of practice of Yoga and how to assess the need for referral to other professional services when needed
- b. Observed capacity for, well-developed communication skills: listening, presence, directive and non-directive dialogue.

6.2 Demonstrated ability

- a. To recognize, adjust, and adapt to specific aspirant needs in the progressive classes.
- b. To recognize and manage the subtle dynamics inherent in the teacher aspirant relationship.

6.3 Principles and skills for educating aspirants

- a. Familiarity with and demonstrated ability to apply effective teaching methods, adapt to unique styles of learning, provide supportive and effective feedback, acknowledge the aspirant's progress, and cope with difficulties.

6.4 Principles and skills for working with groups

- a. Familiarity with and Demonstrated ability to design and implement group programs.
- b. Familiarity of group dynamics and allied techniques of communication skills, time management, and the establishment of priorities and boundaries.
- c. Familiarity with techniques to address the specific needs of individual participants, to the degree possible in a group setting.

SYLLABUS FOR THE POST OF MEDICAL RECORD OFFICER

Subject Knowledge (100 Marks):

A. Hospital and Patient-care Appraisal (10 Marks):

- History and Evolution of Hospitals
- New trends in Hospitals
- Definition of Hospital - Objectives of Hospital.
- Parameters of Good Medical Care/Patterns of Patient Care.
- Functions of Hospital.
- Role of a Hospital in Health is Delivery Systems (HCDS)
- Classification of Hospitals.
- Hospitals Organization and its analysis
- Chart of Organization. – Board and committees
- Duties and responsibilities thereof.
- Departmental Administration
- Delegation
- Decentralization
- Patient Care Appraisal (PCA)
- History of Medical Audit
- Tools and Techniques
- Various Phases of Medical Audit.

B. Departments and Service Units (10 Marks):

- Clinical Departments
- Diagnostic and therapeutic services (including clinical Laboratories, Radiology, Physical Medicine and Rehabilitation and Pharmacy services)
- Nursing Department
- Dietary Department
- Outpatient Department
- Accident and emergency services Department
- Medical Social Service Department
- General and Medical stores
- Blood Bank
- Medical Library services.
- Service units in a hospital Laundry, Housekeeping, CSSD. Miscellaneous Services: Engineering, Mortuary and Transport services.

C. Basic Anatomy (10 Marks):

- General Introduction
- Definition of Anatomy & Physiology.
- Types of Anatomy (including systemic)
- Definition of topographic term/term used to describe the body.

D. Basic Physiology (10 Marks):

- Description of Various regions of the body.
- Cells and tissues of body and general histology.
- Anatomical description of the following:
- Skin and breast – Ontology

- Joints – Ligaments
- Fasciae and Bursae – Musculoskeletal system
- Cardiovascular system – Respiratory system
- Lymphatic system – Blood and blood forming organs
- Congenital system – Endocrine system – Organs of special senses (ear, eye, etc.) – Digestive system – Embryology

E. Basic Pathology and Microbiology (10 Marks):

- Introductory Lectures or specialization of tissues.
- Homeostasis and its importance in mammals.
- Blood and lymphatic system
- Cardiovascular system
- Excretory system, skin and temperature regulation
- Respiratory system
- Digestive system and metabolism
- Endocrinology
- Reproductive system
- Nervous system
- Special senses Muscles
- Definitions and Classification of diseases, Inflammatory diseases – viral and fungal,
 - Inflammatory diseases –Parasitic, - Degenerative diseases – Fatty degeneration, Amyloid etc.
- Tumours – Definition, etiology & classification
- Disturbances in blood flow, pigment disorders
- Hereditary diseases, C.V.S. Blood vessels
- V.S. Heart, Respiratory system
- G.I. tract, Liver Lymphatic system
- Genitourinary system, Skeletal system, transfusion, - Urine composition: variation in common diseases, - CSF and body fluids, - Gastris & Duodenal contents, - Fasces – parasites
- Introduction and historical background,
- Classification special, Characteristics of organisms bacterias, - Asepsis, - Disinfection
- Antiseptics- Sanitation, Infection, Immunity,
- Allergy study of pathogenic organisms, Non-pathology organisms, Virus and fungus,
- Parasitic diseases- their stance in India with lab Diagnosis.

F. Medical Terminology (10 Marks):

- Objective
- Basic
- Elements of Medical Terms (a) Roots (b) Prefixes (c) Suffixes (d) Colours (e) Numerals (f) Symbols
- Terms pertaining to Body as a whole.
- Terms relate to Investigations, and operation, treatment of conditions, disorders of: - Skin and Breast (integumentary system)
- Musculoskeletal
- Neurological and psychiatric
- Cardio- vascular
- Blood and blood forming organs
- Respiratory
- Digestive
- Uro – genital
- Gynaecological
- Maternal, Antenatal and Neonatal conditions

- Endocrine and Metabolic
- Sense organs of: (i) Vision (ii) Hearing Systemic: (i) Infectious diseases. (ii) Immunological diseases. (iii) Diseases of the Connective Tissues
- Geriatrics and Psycho geriatrics. III. Supplementary terms: Selected terms relating: Oncology
- Anesthesiology
- Physical Medicine and Rehabilitation
- Nuclear Medicine
- Plastic Surgery of Burns and Maxillofacial
- Radio- Diagnosis
- Radiotherapy

G. Biostatistics (10 Marks):

- Introduction to Statistics. (ii) Methods of collection of data. (iii) Measures of central tendency (simple average, G.M., H.M. Mode and Median).
- Measures of dispersion (Standard deviation, range, variance, average deviation)
- Sampling; Definition, Methods of sampling (random in systematic, stratified, cluster).
- Correlation and regression: Significance, linear correlation, correlation coefficient, linear regression.
- Time series analysis – concept and its utility, component of time series.
- Test of significance.
- Graphical presentation of data.
- Probability- concept and definition.
- Uses of statistics.
- Sources of hospital statistics (In Patient census, Out – Patient Deptt, and Special Clinics).
- Definitions (live, birth, foetal death, immaturity, cause of death, underlying cause of death inpatient bed etc)
- Analysis of hospital services and discharges.
- Indices (Bed occupancy, average length of stay, bed turn – over interval, death rate, birth rate etc.)
- Vital statistics.
- Uses and Limitations of hospital data.
- Method of compilation of various Health Returns/ Statistical Returns.

H. Healthcare organization (10 Marks):

- Introduction to Principles of Management and Administration scope and importance of management. –Principles of Management. – Functions of a Manager (POSDCORB-E).
- Management Techniques. –Material Management – Personal Administration.
- Financial Administration.
- Public Health Structure in India. – Directive Principles with relation to Public Health & medical Care. – Constitutional lists. – Various five years plans and priorities. Role of Voluntary Health Organisation.
- Basic facts of Health in India.
- Current Objectives and strategies. – Population Dynamics. – Community Health Worker schemes.
- National Health Programmes of Medicine and Homeopathy.
- Other programmes of relevance to Health Sector. – Family Welfare. –
- Medical Termination of Pregnancy. – National Population Policy. – Maternity and Child Health.

I. Medical Record Science (10 Marks):

- Introduction to Medical Record Science.
- Development, Analysis and Uses of Medical Record.
- Development of Medical Record Forms, basic and special
- Order of Arrangements:
 - (a) Ward
 - (b) Medical Record Department.
 - (c) Source oriented medical record.
 - (d) Problem oriented medical record.
 - (e) Integrated Medical Record.
- Analysis of Medical record: (i) Quantitative. (ii) Qualitative.
- Uses of Medical Records: (a) as a personal document (b) as impersonal document.
- Values of the Medical Record

J. International classification of Diseases (10 Marks):

Classification of diseases as per I.C.D.

SYLLABUS FOR THE POST OF MEDICAL SOCIAL SERVICE OFFICER GRADE I

Subject Knowledge (100 Marks):

A. Nature and development of social work (10 Marks)

B. Sociological concepts and contemporary concerns (10 Marks):

Sociological concepts and contemporary concerns urban community development Human rights and social work practice, social policy

C. Human behaviour and social environment (10 Marks):

Human behaviour and social environment, state, political economy and governance, social work with communities, social work with individuals, social work with group research in social work: quantitative approaches

D. Social action and social movements (10 Marks):

Social action and social movements, social work with the elderly, environment and social work, social work with families and children, occupational social work

E. Research in social work (10 Marks):

Research in social work, qualitative approaches

F. Administration of welfare and development services (10 Marks):

Administration of welfare and development services, organizational behaviour and employee development, social defense and correctional services, rural community development

G. Social justice and empowerment (10 Marks):

Social justice and empowerment, social development, management of development organizations Social work with persons with disabilities, aspects of applied social work in hospitals etc. Human rights and social work practice Social work practice in mental health settings

H. Social work and disaster management (10 Marks):

Social work and disaster management, conflict mitigation and peace building, gender and development.

I. Counselling (10 Marks):

Counselling theory and practice

J. HIV/AIDS (10 Marks):

HIV/AIDS and social work practice, health care social work practice

SYLLABUS FOR THE POST OF MEDICO SOCIAL WORKER

A. General Intelligence and Reasoning (20 Marks) :

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. English Language (20 Marks) :

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

C. Subject Knowledge (80 Marks) :

Framework: Social Welfare- The concept of Social Welfare Social Welfare: Concept, need and objectives Philosophy of Social Welfare and Social work Social welfare in historical perspective Changing concepts and practices of social welfare in relation to social, economic and industrial development Changing political philosophy and its impact on social welfare Social Welfare and related terms:

(1) Social Development

(2) Social Planning and social administration

(3) Social reform

(4) Social Security

(5) Social Policy

(6) Social Action

(7) Social justice

(8) Social and welfare services

(9) Social legislation

(10) Human Rights Professional Social work an Introduction The concept of professional social work-alignment of scientific and humanitarian motives for promoting social welfare.

Framework: Social Welfare- The basic principles and values of professional social work and their relationship to the values of Indian Society Evolution of professional social work in UK, USA, Evolution of Professional Social work in India. Social work as a profession Nature and characteristics of a profession.

The basic values and Principles of professional social work Professional status of Social work in India Code of ethics for social workers

Methods of Social Work Primary Methods of Social work Secondary methods of Social work Integrated approach of social work Interface between Professional and voluntary social work

Psychology and Mental Health: Fundamentals –

Mental Health & Psychology, Psychology: Definitions and Fields, Mental Health: Meaning, Definitions, Characteristics

Developmental Sociology:

Characteristics Normal & Abnormal Behaviour: Meaning, Characteristics

Human Development: Heredity and Environment Meaning, Definition and scope of Mental Hygiene Characteristics and Importance of Mental Hygiene Aims of Mental Hygiene

Principles of Mental Hygiene Programme of Mental Hygiene

Developmental Stages

Developmental Stages I: Prenatal, Infancy

Developmental Stages II: Babyhood, Childhood

Developmental Stages III: Puberty, Adolescence, Adulthood.

Developmental Stages III: Middle age, Old age.

Personality Development

Psycho-Sexual development theory:

1. Sigmund Freud

2. Psycho Social development theory: Erick Erickson

3. Defence Mechanism

4. Perspectives of Psychopathology Unit Social Psychology Nature and scope of social psychology Attitude: nature and measurement of attitude prejudice and discrimination Communication: concept, methods, skills in communication, major obstacles Mass communication, public opinion, propaganda, fashion, social facilitation crowd behaviour.

Normal & Abnormal Behaviour: Meaning, Characteristics

Human Development : Heredity and Environment Meaning, Definition and scope of Mental Hygiene Characteristics and Importance of Mental Hygiene Aims of Mental Hygiene Principles of Mental Hygiene Programme of Mental Hygiene Developmental Stages

Developmental Stages I : Prenatal, Infancy

Developmental Stages II : Babyhood, Childhood

Developmental Stages III : Puberty, Adolescence, Adulthood.

Developmental Stages III : Middle age, Old age.

Personality Development

1. Psycho-Sexual development theory: Sigmund Freud

2. Psychosocial development theory: Erick Erickson

3. Defence Mechanism

4. Perspectives of Psychopathology Unit Social Psychology Nature and scope of social psychology Attitude: nature and measurement of attitude prejudice and discrimination Communication: concept, methods, skills in communication, major obstacles Mass communication, public opinion, propaganda, fashion, social facilitation crowd behaviour.

Sociology: Theoretical Perspective-

Conceptual & Theoretical Perspectives to Understand Society

1. Society: Nature, Approaches, Functions, Theories of Society (Evolutionary, Cyclical, Conflict and Systems theories).
2. Social Group: Concept & Characteristics of Primary Group, Secondary Group, Reference Group.
3. Social Institutions: Family, Marriage, Kinship, Property (Present trends).
4. Culture: Concept of Culture, Traditions, Customs, Values and Norms Social System and Social Process of Contemporary Society
5. Social System & Sub system: Structure & Function, Classification of System.
6. Social Structures: Status & Role.
Social Process: Meaning and kinds of Social Interaction, Socialization, Cooperation, Conflict, Assimilation, Social control.

SYLLABUS FOR THE POST OF MODELLAR (ARTIST)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar- diagram, Pie-chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject knowledge (60 Marks):

Introduction to Commercial Art and Fine Art

- What are applied art, commercial art, and fine art?
- How they are beneficial for a designer?
- Introduction of drawing tools
- Design brief and analysis
- Layouts- types and their uses
- Introduction to color schemes
- Creation of various stages in layouting – idea, rough, and finished
- Practical – abstract design with primary and secondary color scheme
- scrap file making

Still Life

- Overview of perspective
- Perspective drawing and composition
- Creating 3D objects
- Practical with colors
- Placement of objects
- Placing object in a composition
- Different types of shading
- Textures in shading
- Shading techniques and reflection
- Understanding shading – glass, steel, mud, clay, fruits, and vegetables etc.
- Objects Composition with colors

Design Elements and Principles

- Design Elements
 - Color
 - Shapes
 - Typography
 - Line
 - Form
 - Value
 - Texture
 - Space
 - Design Principles
 - Balance
 - Movement
 - Rhythm
 - Contrast
 - Pattern
 - Unity
 - Emphasis

Design Essentials

- Grid Systems
- Types of Layouts

Logo Designing

– Types of Logos and their Making

Idea Development, Concept Art, and Visualization

SYLLABUS FOR THE POST OF MEDICAL RECORD TECHNICIAN

PART-I

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (10 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (10 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart

D. English Language (10 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Subject Knowledge (70 Marks):

- Hospital and Patient-care Appraisal
Objectives of Hospital, Parameters of Good Medical Care/Patterns of Patient Care, Functions of Hospital
- Role of a Hospital in Health is- Delivery Systems (HCDS)
- Classification of Hospitals
- Hospitals Organization and its analysis
Chart of Organization, Board and Committees, Duties and responsibilities thereof
- Departmental Administration
Delegation, Decentralization
- Patient Care Appraisal (PCA)
History of Medical Audit, Tools and Techniques, Various Phases of Medical Audit
- Departments and Service Units
Clinical Departments, Diagnostic and therapeutic Services (including Clinical Laboratories, Radiology, Physical Medicine and Rehabilitation and Pharmacy Services), Nursing Department, Dietary Department, Outpatient Department, Accident and Emergency Services Department, Medical Social Service Department (viii) General and Medical Stores, Blood Bank, Medical Library Services, Service units in a Hospital Laundry, Housekeeping, CSSD, Miscellaneous Services : Engineering, Mortuary and Transport Services.
- Basic Anatomy
Definition of Anatomy & Physiology, Types of Anatomy (including systemic), Definition of topographic term/term used to describe the body, Descriptions of various regions of the body.
 - Basic Physiology
Introductory Lectures or specialization of tissues, Homeostasis and its importance in mammals, Blood and lymphatic system Cardiovascular system, Excretory system, Skin and temperature regulation, Respiratory System, Digestive system and metabolism Endocrinology, Reproductive System, Digestive System and Metabolism Endocrinology, Reproductive System, Nervous System, Special Senses, Muscles
 - Basic Pathology and Microbiology
Definitions and Classification of diseases: Inflammatory diseases- viral and fungal, inflammatory diseases- Parasitic, Degenerative diseases, Fatty degeneration, Amyloid etc.

Tumors- Definition, etiology & classification, Disturbances in blood flow, Pigment disorders, Hereditary diseases, C.V.S. Blood vessels, V.S. Heart, Respiratory System, G.I. tract, Liver Lymphatic System, Genitourinary System, Skeletal System, Blood, Central Nervous System, Endocrine System
- Clinical Pathology: Normal Composition of blood, disease of RBCs, WBCs, Platelets, Coagulation factors and disorders, Blood groups and cross matching, Blood transfusion, Urine Composition: variation in common disease, CSF and body fluids, Gastris and Duodenal contents, Fasces, Parasites, Introduction and historical background, Classification special, Characteristics of organisms bacteria's, Asepsis, Disinfection Antiseptics, Allergy study of pathogenic organisms, Non-pathology organisms, Virus and fungus, Parasitic diseases- their stance in India with lab Diagnosis.

- **Medical Terminology:**
 - Objective
 - Basic
 - Elements of Medical Terms:
 - Roots, Prefixes, Suffixes, Colours, Numerals, Symbols, Abbreviation

Terms pertaining to Body as a whole.

Terms relate to Investigations, and operation, treatment of conditions, disorders-

Skin and Breast (integumentary system), Musculoskeletal, Neurological and Psychiatric, Cardio-vascular, Blood and blood forming organs, Respiratory, Digestive, Uro-genital, Gynecological, Maternal, Antenatal and Neonatal conditions, Endocrine and Metabolic, Sense organs of: Vision, Hearing

Systemic: Infectious diseases, Immunological diseases, Diseases of the Connective Tissues, Diseases of the Connective Tissues

Geriatrics and Psycho geriatrics.

Supplementary terms: Selected terms relating-

Oncology, Anesthesiology, Physical Medicine and Rehabilitation, Nuclear Medicine, Plastic Surgery of Bums and Maxillofacial, Radio-diagnosis, Radiotherapy

- **Biostatistics:**
 - Introduction to Statistics
 - Methods of collection of data
 - Measures of central tendency (simple average, G.M., H.M., Mode and Median)
 - Measures of dispersion (Standard deviation, Range, variance, average deviation)
 - Sampling; Definition, Methods of sampling (random systematic, stratified, cluster)
 - Correlation and regression: Significance, linear correlation, correlation coefficient, linear regression.
 - Time series analysis- concept and its utility, component of time series.
 - Test of significance.
 - Graphical presentation of data.
 - Probability- concept and definition.
 - Uses of statistics.
 - Sources of hospital statistics (In- Patient census, Out — Patient Deptt, and Special Clinics).
 - Definitions (live, birth, foetal death, immaturity, cause of death, underlying cause of death inpatient bed etc)
 - Analysis of hospital services and discharges.
 - Indices (Bed occupancy, average length of stay, bed turn — over internal, death rate birth rate etc.)
 - Vital statistics.
 - Uses and Limitations of hospital data.
 - Method of compilation of various Health Returns/Statistical Returns.

- **Healthcare Organization:**

Introduction to Principles of Management and Administration

Scope and importance of management, Principles of Management, Functions of a Manager (POSDCORB-E). Management Techniques, Material Management, Personal Administration Financial Administration

Public Health Structure in India:

With relation to public Health & medical Care, Constitutional lists, various five years plans and priorities

Role of Voluntary Health Organization

Basic facts of Health in India.

Current Objectives and strategies:

Population Dynamics, Community Health Worker schemes.

National Health Programmes of Medicine and Homeopathy.

Other programmes of relevance to Health Sector:

Family Welfare, Medical Termination of Pregnancy, National Population Policy, Maternity and Child Health.

- Medical Record Science

Introduction to Medical Record Science, Development, Analysis and Uses of Medical Record.

Development Medical Record Forms, basic and special.

Order of Arrangements:

Ward, Medical Record Department, Source Oriented Medical Record, Problem oriented Medical Record, Integrated Medical Record.

Analysis of Medical Record:

Quantitative, Qualitative.

Uses of Medical Records:

As a personal document, As impersonal document.

Values of the Medical Record

- International classification of Diseases

Classification of diseases as per I.C.D

PART-II

Skill Test:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF MULTI REHABILITATION WORKER (PHYSIOTHERAPIST)

Subject Knowledge (120 Marks):

HUMAN BODY & HUMAN DEVELOPMENT

- Gross motor development
- Fine Motor development
- The development of drawing and writing
- Developmental milestones of daily living skills
- Cognitive development
- Perceptual development
- Generalization
- Language mediation for motor development
- Social & emotional development
- Development of play in 0-6 years.
- Visual development
- Development of hearing.

COUNSELLING

- Nature, meaning & scope of guidance & counselling
- Role of home & type school
- Techniques of guidance & counselling with reference to disabled
- Vocational guidance for disabled.
- Individual problems and stress management through counselling

DISABILITY & REHABILITATION - related issues

CAUSES & PREVENTION OF IMPAIRMENTS

- Disability: genesis, magnitude, futuristic trends
- Disability types and causes
- Disability limitation & prevention
- Preventable disabilities: strategies & approaches Early detection & intervention
- Rehabilitation: Definition, aims, objectives & Philosophy of rehabilitation
- Rehabilitation approaches and systems
- Different models of service delivery
- Community based rehabilitation concepts & approaches

DISABILITY PROCESS AND CAUSATIVE FACTORS

- Magnitude of Problem, Genesis, Sign, Symptoms, diagnosis, prognosis, morbidity and mortality.

GENERAL MEDICAL CONDITIONS

- Neurology
- Pediatrics
- Skin
- Medical conditions
- Psychiatric conditions

SURGICAL CONDITIONS

- General Surgery/Plastic Surgery

AUDIOLOGY AND AURAL REHABILITATION

- Hearing Mechanism
- Identification and assessment of Hearing
- Hearing aids, Assistive devices and Ear moulds
- Auditory Training

LANGUAGE AND SPEECH

- **Language**-Definition, function. Definition, nature, mode and scope of communication, Biological and psychological foundation of language, Effects of hearing impairment on language development, Critical period and its importance
- **Speech**-Definition, Concept of Speech, Development of Speech
- Language and Speech Therapy

PHYSICAL AGENTS AND EXERCISE THERAPY

- Exercise therapy
- Heat and cold therapy
- Electro therapy

FABRICATION OF VARIOUS SUPPORTIVE AND SUBSTITUTIVE APPLIANCE

- Above knee prostheses
- Below knee prostheses
- Above knee calliper
- Below knee calliper

ANATOMY AND PHYSIOLOGY OF THE EYE

- Prevention of blindness
- Education of visually impaired children
- Integration of blinds
- Orientation and mobility of blinds
- Rehabilitation of the elderly Blind

MENTAL RETARDATION - NATURE AND NEEDS

- Assessment and Evaluation
- Special Education for Children with M.R.
- Curriculum and Educational Intervention.
- Problem Behavior in Persons with Mental Retardation and its management.

REHABILITATION THERAPY CEREBRAL PALSY AND OTHER NEUROLOGICAL CONDITIONS

RECENT ADVANCES IN EQUIPMENT'S RELATED TO PHYSIOTHERAPY

SYLLABUS FOR THE POST OF OCCUPATIONAL THERAPIST

Subject Knowledge (100 Marks)

A. Anatomy (10 Marks) :

- General and Applied anatomy
- Musculoskeletal system – Connective tissue & its modification, tendons, membranes, special connective tissue
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.
- Central nervous system – disposition, parts and functions
- Cardiovascular system
- Lymphatic system
- Respiratory system
- Digestive system
- Urinary and Reproductive system
- Endocrine system

B. Physiology (10 Marks) :

- General Physiology
- Blood
- Cardiovascular system
- Respiratory System
- Nerve Muscle Physiology
- Nervous system
- Renal System
- Digestive System
- Endocrinology

C. Fundamentals of Occupational Therapy (10 Marks)

D. History & development of Occupational Therapy Rehabilitation (10 Marks)

E. Occupational performance model Generalized & specific principles of therapeutic exercises (10 Marks)

F. Therapeutic modalities (10 Marks)

G. Principles & methods of testing range of motion & muscle strength. Testing methods of sensation, perception, coordination and muscle tone (10 Marks)

H. Human development and its importance in occupational therapy. General principles of human maturation (10 Marks)

I. Activities of daily living Occupational therapy as diagnostic & prognostic procedure. Steps involved in preparing the client for return to work (10 Marks)

J. Prevocational evaluation (10 Marks)

- Evaluation of work capacity
- Evaluation of physical capacity
- Evaluation of functional capacity
- On the job or work site evaluation
- Work samples such as TOWER, BTE, WEST
- Work hardening & work conditioning
- Different types of tools & equipment's & their uses in Occupational Therapy
- Define & classify splints with their brief description, state general principles of splinting, describe material used.

SYLLABUS FOR THE POST OF OFFICE ASSISTANT (N.S.)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Central Govt. Service Rules (80 Marks):

Central Government Rules: Questions relating to CCS (Leave) Rule, CCS (Conduct) Rules, GFR, FR/SR, General Service Condition, Office Procedures, Types of correspondence, General Knowledge about IPC/CRPC, CPC/CAT/High Court, RTI Act, 2005, Establishment, Reservation, Roster, LTC, Travelling Allowance etc.

SYLLABUS FOR THE POST OF OFFICE/STORES ATTENDANT (MULTI-TASKING)

A. General Intelligence and Reasoning (50 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (50 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (50 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart

D. English Language (50 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

SYLLABUS FOR THE POST OF OPERATOR (E&M)/LIFT OPERATOR

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (Electrical) (20 Marks):

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.
- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, die and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

F. Subject Knowledge (Mechanical) (20 Marks):

- **Basic Safety:** Safety introduction, Personal protection. Basic injury prevention Hazard identification and avoidance, safety signs for Danger, warning, caution and personal safety messages. Use of Fire extinguishers. Various safety measures involved in the Industry. Elementary first Aid. Concept of Standard. Personal safety and factory safety.
- Conservation of Energy
- Engineering Materials
- Mechanics of Solids
- Workshop Technology
- Hydraulics and Pneumatics
- Theory of Machines
- Preventive Maintenance of machines
- Design and Estimation
- Production Technology
- Advanced Manufacturing Processes
- Industrial Engineering and Safety
- Metrology and Measuring Instruments
- Repair and Maintenance
- Disaster Management and Safety
- Introduction of fitting trade. Marking tools; callipers Dividers, Surface plates, Angle plates, Scribes, punches, surface gauges Types, Uses, Care and maintenance. Use of different bench tools used by sheet metal worker. Description and types of taps and dies, Description of marking and cutting tools such as snubs shears punches and other tools like hammers, mallets, etc. used by sheet metal workers. Types of rivets and riveted joints. Use of thread gauge. Different types of threads. Materials, fluxes and process. Care and maintenance of tools. Introduction to thermometers, pressure gauges etc.

SYLLABUS FOR THE POST OF PACS ADMINISTRATOR

Subject Knowledge (120 Marks):

A. PACS Administrator (Technical Officer Photography) :

- Department Organization: Digital Imaging and PACS
- The components of a PACS system
- Compare data & workflows in an analog and digital environment
- Summarize how studies are archived, queried and retrieved
- Identify system software components
- The concept of streaming and compression of images
- Identify and construct system users, groups, profiles
- Features and functions of the Work Flow Manager Administration tool Perform updates and reconciliation of studies in the PACS database
- The flow of images to be stored on the PACS system
- The DICOM parsing function to map DICOM fields to other DICOM fields
- The function of the Info Router software, construct rules and perform monitoring of jobs
- The IS Link software and its relationship with Radiology Orders and Reports
- CD Direct key features and functions
- The email key features and functions
- The Data Import key features and functions
- The Non-DICOM Import key features and functions
- Key functions of the PACS System Administrator
- Pre-implementation strategy for the PACS, project management during installation and implementation of the PACS, and take total ownership of the PACS system at the completion of the implementation
- Tasks and necessary knowledge to properly manage the PACS system
- Navigate Archive Explorer • Select and use various tools in the display area
- Differentiate between view box layout and group layout, as well as navigate through stacked viewers.
- Utilize the Power Viewer toolsets
- Adjust parameters of MPR, and utilize its functions
- Utilize the 3D toolsets
- Define, edit, create, quantify and annotate vessel analysis
- Utilized the system's mammography toolset
- Basic functions of OrthoView, Cardiac Analysis, Cardiac PACS, PET-CT/MRI Fusion, and Volume Matching
- Interpret and utilize DICOM Header information

B. PACS (SYSTEM ADMINISTRATION):

- Configure and utilize Display Protocols
- List and perform how to start and stop system processes
- Perform system check
- Monitor license status
- Daily, weekly and situational preventative maintenance procedures
- Working knowledge of Digital Dashboard
- Monitor log files
- Monitor Audit Trail events
- Configuration of the PACS WFM server

- Life Cycle configuration and Auto delete priorities
- The RMS software agents perform
- Proficiency in troubleshooting various common issues
- How to contact Care stream Support Center, and the information to be provided for the Issue
- System Administrator Responsibilities
- Overview of Workflow – Analog vs. Digital
- Virtual Tour of Hospital
- Overview of Image Workflow
- Overview of Storage Workflow
- Care stream PACS v11.xx Overview
- User Administration
- Database Administration
- Info Router
- IS Link
- CD Direct
- Email
- Data Importing
- DICOM
- Documents
- System Configuration
- Troubleshooting
- PACS Admin Role
- Care stream Client

C. PACS (System Administration):

- Archive Explorer
- Display Area
- DICOM Tags
- Display Area Con't
- View box Layout
- MPR & 3D
- Vessel Analysis
- Mammography
- Display Protocols
- System Monitoring – Dashboard, Logs, Audit Trail
- Digital Imaging and PACS: Picture Archiving and Communication System
- Digital Imaging and PACS: what should a radiologist expect from PACS
- Digital Imaging and PACS: Image processing in Computed Radiography
- Intravascular Contrast Media
- Whole body Computed Tomography: Recent Advances
- Magnetic Resonance imaging basic Principles Ultrasound: general Principles
- Radionuclide Imaging: General Principles
- Radionuclide Imaging: Paediatric Nuclear Medicine
- Dual Energy X-ray Absorptiometry
- Functional and Physiological Imaging
- Medico legal issues in Diagnostic Radiology
- Radiation Protection and patient doses in diagnostic radiology

SYLLABUS FOR THE POST OF PERSONAL ASSISTANT

PART-I

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (20 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (20 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

PART-II

Skill Test in Stenography:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF PHARMA CHEMIST/CHEMICAL EXAMINER

Subject Knowledge (100 Marks):

Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.

Metrology-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products .Use of alligation method in calculations, Isotonic solutions.

Packaging of pharmaceuticals-Desirable features of a container and types of containers. Study of glass & plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging.

Size reduction, objectives, and factors affecting size reduction, methods of size reduction- study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.

Size separation-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.

Mixing and Homogenization-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.

Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, sintered filters, Filter candles, Metafilter.

Extraction and Galenicals-

(c) Study of percolation and maceration and their modification, continuous hot extraction- Application in the preparation of tinctures and extracts.

(d) Introduction to Ayurvedic dosage forms.

Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.

Distillation-Simple distillation and Fractional distillation, steam distillation and vacuum distillation. Study of vacuum still, preparation of purified water I.P. and water for Injection I.P. construction and working of the still used for the same.

Introduction to drying process-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and Freeze Dryer.

Sterilization-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process.

Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration and Gaseous sterilization.

Aseptic techniques-Applications of sterilization process in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

Processing of Tablets-Definition; different type of compressed tables and their properties. Processes involved in the production of tablets; Tablets excipients ; Defects in tablets; Evaluation of Tablets; Physical standards including Disintegration and Dissolution. Tablet coating-sugar coating; films coating, enteric coating and micro-encapsulation (Tablet coating may be de.. in an elementary

manner).

Processing of Capsules-Hard and soft gelatin capsules; different sizes of capsules; filling of capsules; handling and storage of capsules. Special applications of capsules.

Study of immunological products like sera, vaccines, toxoids & their preparations.

PHARMACOGNOSY

1. Definition, history and scope of Pharmacognosy including indigenous system of medicine.
2. Various systems of classification of drugs and natural origin.
3. Adulteration and drug evaluation; significance of pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

- (a) **Laxatives**- Aloes, Rhubarb, Castor oil, Ispaghula, Senna.
- (b) **Cardiotonics**- Digitalis, Arjuna.
- (c) **Carminatives & G.I. regulators**- Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom, Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.
- (d) **Astringents**- Catecheu.
- (e) **Drugs acting on nervous system**- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux-vomica.
- (f) **Antihypertensive**- Rauwolfia.
- (g) **Antitussives**- Vasaka, Tolu balsam, Tulsi.
- (h) **Antirheumatics**- Guggal, Colchicum.
- (i) **Antitumour**- Vinca.
- (j) **Antileptotics**- Chaulmoogra oil.
- (k) **Antidiabetics**- Pterocarpus, Gymnema sylvestro.
- (l) **Diuretics**- Gokhru, Punarnava.
- (m) **Antidysenterics**- Ipecacuanha.
- (n) **Antiseptics and disinfectants**- Benzoin, Myrrh, Neem, Curcuma.
- (o) **Antimalarials**- Cinchona.
- (p) **Oxytocics**- Ergot.
- (q) **Vitamins**- Shark liver oil and Amla.
- (r) **Enzymes**- Papaya, Diastase, Yeast.
- (s) **Perfumes and flavoring agents**- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandalwood.

Pharmaceutical aids-Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guar gum, Gelatin.

Miscellaneous- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankpushpi, pyrethrum, Tobacco.

Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings- cotton, silk, wool and regenerated fibers.

Gross anatomical studies of-senna, Datura, cinnamon, cinchona, fennel, clove, Ginger, Nuxvomica & ipecacuanha.

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Introduction to biochemistry. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

Carbohydrates: Brief chemistry and role of carbohydrates, classification, qualitative tests,

Diseases related to carbohydrate metabolism.

Lipids: Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to lipids metabolism.

Vitamins: Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in life processes.

Enzymes: Brief concept of enzymatic action. factors affecting it.

Therapeutics: Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in health and disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

HUMAN ANATOMY AND PHYSIOLOGY

Scope of Anatomy and physiology. Definition of various terms used in Anatomy. Structure of cell, function of its components with special reference to mitochondria and microsomes.

Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

Skeletal System: Structure and function of Skeleton. Classification of joints and their function. Joint disorders.

Cardiovascular System: Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood. Name and functions of lymph glands. Structure and functions of various parts of the heart. Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration.

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology of renal diseases and edema.

Muscular System: Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. physiology of neuromuscular junction.

Central Nervous System: Various parts of central nervous system, brain and its parts, functions and reflex action. Anatomy and physiology of automatic nervous system.

Sensory Organs: Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

Digestive System: names of various parts of digestive system and their functions. structure and functions of liver, physiology of digestion and absorption.

Endocrine System: Endocrine glands and Hormones. Location of glands, their hormones and functions. pituitary, thyroid. Adrenal and pancreas

Reproductive system: Physiology and Anatomy of Reproductive system.

HEALTH EDUCATION AND COMMUNITY PHARMACY

Concept of health: Definition of physical health, mental health, social health, spiritual health determinants of health, indicator of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

Nutrition and health: Classification of foods, requirements, diseases induced due to deficiency of proteins, vitamins and minerals-treatment and prevention.

Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.

First aid: Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.

Environment and health: Source of water supply, water pollution, purification of water, health and air, noise, light-solid waste disposal and control-medical entomology, arthropod borne diseases and their control. rodents, animals and diseases.

Fundamental principles of microbiology: Classification of microbes, isolation, staining techniques of organisms of common diseases.

Communicable diseases: Causative agents, mode of transmission and prevention. Respiratory infections- chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.

Intestinal infection-poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.

Arthropod borne infections-plague, Malaria, filariases.

Surface infection-Rabies, Trachoma, Tetanus, Leprosy.

Sexually transmitted diseases-Syphilis, Gonorrhoea, AIDS.

Non-communicable diseases: causative agents, prevention, care and control.

Epidemiology: Its scope, methods, uses, dynamics of disease transmission. Immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

PHARMACEUTICS (Dispensing Pharmacy)

Prescriptions-Reading and understanding of prescriptions; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved in dispensing.

Incompatibilities in prescriptions- study of various types of incompatibilities-physical, chemical and therapeutic.

Posology- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age, sex, surface area and veterinary doses.

Dispensed Medications: (Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. special labeling requirements and storage conditions should be highlighted).

Powders-Type of powders-Advantages and disadvantages of powders, Granules, cachets and tablet triturates. preparation of different types of powders encountered in prescriptions. Weighing methods, possible errors in weighing, minimum weighable amounts and weighing of a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

Liquid oral Dosage forms:

Monophasic-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colorants and flavors, with examples.

Review of the following monophasic liquids with details of formulation and practical methods.

Liquids for internal administration Liquids for external administration or used on mucous membranes

Mixtures and concentrates, Gargles

Syrups Mouth washes

Douches

Throat-paints

Ear Drops

Elixirs

Nasal

drops

Lotions.

Sprays

Liniments

Biphasic Liquid Dosage Forms:

Suspensions (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant used like thickening agents, wetting agents, their necessity and quantity to be incorporated, suspensions of precipitate forming liquids like tinctures, their preparations and stability. suspensions produced by chemical reaction. An introduction to flocculated /non-flocculated suspension system.

Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

Semi-Solid Dosage Forms:

Ointments: Types of ointments, classification and selection of dermatological vehicles.

Preparation and stability of ointments by the following processes:

Trituration

fusion

chemical reaction

Emulsification.

Pastes: Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation.

Jellies: An introduction to the different types of jellies and their preparation. An elementary study of poultice.

Suppositories and pessaries-Their relative merits and demerits, types of suppositories, suppository bases, classification, properties, preparation and packing of suppositories. Use of suppositories of drug absorption.

Dental and cosmetic preparations: Introduction to Dentifrices, facial cosmetics, Deodorants. Antiperspirants, shampoo, Hair dressings and Hair removers.

Sterile Dosage forms:

Parenteral dosage forms-Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.

Sterility testing: particulate matter monitoring- Faculty seal packaging.

Ophthalmic products: study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

PHARMACEUTICAL CHEMISTRY

3. Introduction to the nomenclature of organic chemical systems with particular reference to heterocyclic system containing up to 3 rings.
4. The chemistry of following pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties (chemical structure of only those compounds marked with asterisk (*)). The stability and storage conditions and the different type of pharmaceutical formulations of these drugs and their popular brand names.

Antiseptics and Disinfectants-Proflavine*, Benzalkonium chloride, Cetrimide, Phenol, chloroxylenol, Formaldehyde solution, Hexachlophene, Nitrofurantoin.

Sulphonamides-Sulphadiazine, Sulphaguanidine, Phthalylsulphathiazole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxy-pyridazine, Co-trimoxazole, sulfacetamide*

Antileprotic Drugs- Clofazimine , Thiambutosine, Dapsone*, solapsone,

Anti-tubercular Drugs- Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide*.

Antimoebic and Anthelmintic Drugs- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin , Piperazine*, Mebendazole ,D.E.C.*

Antibiotics- Benzyl penicillin*, Phenoxy methyl penicillin*, Benzathine penicillin, Ampicillin*, Cloxacillin, Carbencicillin, Gentamicin, Neomycin, Erythromycin, Tetracycline, Cephalexin, Cephaloridine, Cephalothin, Griseofulvin, Chloramphenicol.

Antifungal agents- Udecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

Antimalarial Drugs-Chloroquine*,Amodiaquine, Primaquine, Proguanil, Pyrimethamine*, Quinine, Trimethoprim.

Tranquilizers-Chlorpromazine*,Prochlorperazine,Trifluoperazine, Thiothixene,Haloperidol*, Triperiodol, Oxypertine, Chlordizepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics-Phenobarbitone*,Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide*, Methypylon, Paraldehyde, Triclofosodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopecal sodium, Trichloroethylene .

Antidepressant Drugs- Amitriptyline, Nortriptyline, Imperamine*, Phepelzine, Tranylcypromine.

Analeptics- Theophylline, Caffeine*, Coramine*, Dextro-amphetamine.

Adrenergic drugs- Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine, Salbutamol, Terbutaline,Ephedrine*, Pseudoephedrine.

Adrenergic antagonist- Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs- Neostigmine*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*.

Cholinergic Antagonists- Atropine*, Hyoscine, Homatropine, Propantheline*, Benztropine, Tropicamide,Biperiden*.

Diuretic Drugs- Furosemide*, Chlorothiazide, Hydrochlorothiazide*, Benzthiazide, Urea*, Mannitol*,Ethacrynic Acid.

Cardiovascular Drugs- Ethylnitrite*, Glyceryl trinitrate, Alpha methyl-dopa, Guanethidine, Clofibrate,Quinidine.

Hypoglycemia Agents- Insulin, Chlorpropamide*, Tolbutamide, Glibenclamide, Phenformin*, Metformin. **Coagulants and Anti coagulants**- Heparin, Thrombin, Menadione*, Bisphydroxycoumarin, Warfarin sodium.

Local Anaesthetics- Lignocaine*, Procaine*, Benzocaine,

Histamine and anti Histaminic Agents- Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine*, Pheniramine, Chlorpheniramine*,

Analgesics and Anti-pyretics-Morphine, Pethidine, Codeine, Mathadone, Aspirin*, Paracetamol, Analgin, Dextropropoxphene, Pentazocine.

Non-steriodal anti-inflammatory agents- Indomethacin*, Phenylbutazone*, Oxyphenbutazone, Ibuprofen.

Thyroxine and Antithyroids- Thyroxine*, Methimazole, Methyl thiouracil, Propylthiouracil.

Diagnostic Agents- Lopanoic Acid, Propyliodone, Sulfobromophthalein-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.

Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.

Steroidal Drugs- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

Anti-Neoplastic Drugs- Actinomycin, Azathioprie, Busulphan, Chloramubucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochloride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

PHARMACOLOGY & TOXICOLOGY

Introduction to Pharmacology, Scope of Pharmacology.

Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

General mechanism of drugs action and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

Drugs acting on the central Nervous system:

General anaesthetics- adjunction to anaesthesia, intravenous anaesthetics. Analgesic antipyretics and non-steroidal

Anti-inflammatory drugs- Narcotic analgesics. Antirheumatic and anti-gout remedies.

Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics. Centrally acting muscle relaxants and anti-parkinsonism agents. Local anesthetics.

Drugs acting on autonomic nervous system.

Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs. Adrenergic drugs and adrenergic receptor blockers.

Neurone blockers and ganglion blockers. Neuromuscular blockers, used in myasthenia gravis.

Drugs acting on eye: Mydriatics, drugs used in glaucoma.

Drugs acting on respiratory system, Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

Autocoids: physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins.

Cardio vascular drugs

Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.

Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic, Blood substitutes and plasma expanders.

Drugs affecting renal function- Diuretics and anti-diuretics.

Hormones and hormone antagonists- Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives, corticosteroids.

Drugs acting on digestive system-carminatives, digest ants, Bitters, Antacids and drugs used in pepticulcer, purgatives and laxatives, Anti-diarrohoeals, Emetics, Anti-emetics, Antispasmodics.

Chemotherapy of microbial diseases:

Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti-tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs. Chemotherapy of protozoal diseases, Anthelmintic drugs. Chemotherapy of cancer.

PHARMACEUTICAL JURISPRUDENCE

Origin and nature of pharmaceutical legislation in India, its scope and objectives. Evolution of the "Concept of pharmacy" as an integral part of the Health care system.

Principles and significance of professional Ethics. Critical study of the code of pharmaceutical Ethics drafted by pharmacy council of India.

Pharmacy Act, 1948-The General study of the pharmacy Act with special reference to Education Regulations, Working of state and central councils, constitution of these councils and functions, Registration procedures under the Act.

The Drugs and Cosmetics Act, 1940-General study of the Drugs and cosmetics Act and the Rules there under. Definitions and salient features related to retail and whole sale distribution of drugs. The powers of Inspectors, the sampling procedures and the procedure and formalities in obtaining licenses under the rule. Facilities to be provided for running a pharmacy effectively. General study of the schedules with special reference to schedules C,C1,F,G,J,H,P and X and salient features of labeling and storage conditions of drugs.

The Drugs and Magic Remedies (objectionable Advertisement) Act, 1954-General study of the Act, objectives, special reference to be laid on Advertisements, magic remedies and objections¹ and permitted advertisements -diseases which cannot be claimed to be cured.

Narcotic Drugs and psychotropic substances Act, 1985-A brief study of the act with special reference to its objectives, offences and punishment.

Brief introduction to the study of the following acts:

Latest Drugs (price control) order in force (as amended to date)

Medicinal and Toilet preparations (excise Duties) Act, 1955 (as amended to date). Medical Termination of Pregnancy Act, 1971.

DRUG STORE AND BUSINESS MANAGEMENT

Introduction-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

Drug House Management-selection of site, space Lay-out and legal requirements. Importance and objectives of purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto. Codification, handling of drug stores and other hospital supplies. Inventory Control-objects and importance, modern techniques like ABC,VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.

Sales promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.

Recruitment, training, evaluation and compensation of the pharmacist.

Banking and Finance-Service and functions of bank, Finance planning and sources of finance.

HOSPITAL AND CLINICAL PHARMACY

Hospital-Definition, Function, classifications based on various criteria,organization, Management and health delivery system in India.

Hospital Pharmacy: Definition Functions and objectives of Hospital pharmaceutical services. Location,Layout, Flow chart of materials and men. Personnel and facilities requirements including equipments based on individual and basic needs. Requirements and abilities required for Hospital pharmacists.

Drug Distribution system in Hospitals. Out-patient service, In-patient services- types of services detailed discussion of unit Dose system, Floor ward stock system,satellite pharmacy services, central sterile services, Bed side pharmacy.

Manufacturing: Economical considerations, estimation of demand.

Sterile manufacture-Large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

Non-sterile manufacture-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

Hospital Formulary system and their organization, functioning, composition.

Drug Information service and Drug Information Bulletin.

Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V. sets, B.G. sets, Ryals tubes, Catheters, Syringes etc.

Application of computers in maintenance of records, inventory control, medication monitoring, drug information and data storage and retrieval in hospital retail pharmacy establishment.

Clinical Pharmacy:

Introduction to Clinical pharmacy practice- Definition, scope.

Modern dispensing aspects- Pharmacists and patient counseling and advice for the use of common drugs, medication history.

Common daily terminology used in the practice of Medicine.

Disease, manifestation and patho-physiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Physiological parameters with their significance.

Drug Interactions: Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.

Adverse Drug Reaction: Definition and significance. Drug-Induced diseases and Teratogenicity.

Drugs in Clinical Toxicity- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organophosphorus poisons.

Drug dependences, drug abuse, addictive drugs and their treatment, complications.

Bio-availability of drugs, including factors affecting it.

SYLLABUS FOR THE POST OF PHARMACIST GRADE II

Subject Knowledge (100 Marks):

Introduction of different dosage forms. Their classification with examples-their relative applications. Familiarization with new drug delivery systems. Introduction to Pharmacopoeias with special reference to the Indian Pharmacopoeia.

Metrology-System of weights and measures. Calculations including conversion from one to another system. Percentage calculations and adjustment of products .Use of allegation method in calculations, Isotonic solutions.

Packaging of pharmaceuticals-Desirable features of a container and types of containers. Study of glass & plastics as materials for containers and rubber as a material for closure-their merits and demerits. Introduction to aerosol packaging.
Size reduction, objectives, and factors affecting size reduction, methods of size reduction- study of Hammer mill, ball mill, Fluid energy mill and Disintegrator.

Size separation-size separation by sifting. Official standards for powders. Sedimentation methods of size separation. Construction and working of Cyclone separator.

Mixing and Homogenization-Liquid mixing and powder mixing, Mixing of semisolids. Study of silverson Mixer-Homogenizer, planetary Mixer; Agitated powder mixer; Triple Roller Mill; Propeller Mixer, colloid Mill and Hand Homogeniser. Double cone mixer.

Clarification and Filtration-Theory of filtration, Filter media; Filter aids and selection of filters. Study of the following filtration equipments-Filter Press, sintered filters, Filter candles, Metafilter.

Extraction and Galenicals-

(e) Study of percolation and maceration and their modification, continuous hot extraction- Application in the preparation of tinctures and extracts.

(f) Introduction to Ayurvedic dosage forms.

Heat process-Evaporation-Definition-Factors affecting evaporation-study of evaporating still and Evaporating pan.

Distillation-Simple distillation and Fractional distillation, steam distillation and vacuum distillation. Study of vacuum still, preparation of purified water I.P. and water for Injection I.P. construction and working of the still used for the same.

Introduction to drying process-Study of Tray Dryers; Fluidized Bed Dryer, Vacuum Dryer and FreezeDryer.

Sterilization-Concept of sterilization and its differences from disinfection-Thermal resistance of microorganisms. Detailed study of the following sterilization process.
Sterilization with moist heat, Dry heat sterilization, Sterilization by radiation, Sterilization by filtration and Gaseous sterilization.

Aseptic techniques-Applications of sterilization process in hospitals particularly with reference to surgical dressings and intravenous fluids. Precautions for safe and effective handling of sterilization equipment.

Processing of Tablets-Definition; different type of compressed tables and their properties. Processes involved in the production of tablets; Tablets excipients ; Defects in tablets; Evaluation of Tablets; Physical standards including Disintegration and Dissolution. Tablet coating-sugar coating; films coating, enteric coating and micro-encapsulation (Tablet coating may be de.. in an elementary manner).

Processing of Capsules-Hard and soft gelatin capsules; different sizes of capsules; filling of

capsules; handling and storage of capsules. Special applications of capsules.

Study of immunological products like sera, vaccines, toxoids & their preparations.

PHARMACOGNOSY

1. Definition, history and scope of Pharmacognosy including indigenous system of medicine.
2. Various systems of classification of drugs and natural origin.
3. Adulteration and drug evaluation; significance of pharmacopoeial standards.
4. Brief outline of occurrence, distribution, outline of isolation, identification tests, therapeutic effects and pharmaceutical application of alkaloids, terpenoids, glycosides, volatile oils, tannins and resins.
5. Occurrence, distribution, organoleptic evaluation, chemical constituents including tests wherever applicable and therapeutic efficacy of following categories of drugs.

- (a) **Laxatives**- Aloes, Rhubarb, Castor oil, Ispaghula, Senna.
- (b) **Cardiotonics**- Digitalis, Arjuna.
- (c) **Carminatives & G.I. regulators**- Umbelliferous fruits, Coriander, Fennel, Ajowan, Cardamom, Ginger, Black pepper, Asafoetida, Nutmeg, Cinnamon, Clove.
- (d) **Astringents**- Catechu.
- (e) **Drugs acting on nervous system**- Hyoscyamus, Belladonna, Aconite, Ashwagandha, Ephedra, Opium, Cannabis, Nux-vomica.
- (f) **Antihypertensive**- Rauwolfia.
- (g) **Antitussives**- Vasaka, Tolu balsam, Tulsi.
- (h) **Antirheumatics**- Guggal, Colchicum.
- (i) **Antitumour**- Vinca.
- (j) **Antileptics**- Chaulmoogra oil.
- (k) **Antidiabetics**- Pterocarpus, Gymnema sylvestre.
- (l) **Diuretics**- Gokhru, Punarnava.
- (m) **Antidysenterics**- Ipecacuanha.
- (n) **Antiseptics and disinfectants**- Benzoin, Myrrh, Neem, Curcuma.
- (o) **Antimalarials**- Cinchona.
- (p) **Oxytocics**- Ergot.
- (q) **Vitamins**- Shark liver oil and Amla.
- (r) **Enzymes**- Papaya, Diastase, Yeast.
- (s) **Perfumes and flavoring agents**- peppermint oil, Lemon oil, Orange oil, lemon grass oil, sandalwood.

Pharmaceutical aids- Honey, Arachis oil, starch, kaolin, pectin, olive oil. Lanolin, Beeswax, Acacia, Tragacanth, sodium Alginate, Agar, Guar gum, Gelatin.

Miscellaneous- Liquorice, Garlic, picrorhiza, Dirscorea, Linseed, shatavari, shankhpushpi, pyrethrum, Tobacco.

Collection and preparation of crude drugs for the market as exemplified by Ergot, opium, Rauwolfia, Digitalis, senna.

Study of source, preparation and identification of fibers used in sutures and surgical dressings- cotton, silk, wool and regenerated fibers.

Gross anatomical studies of- senna, Datura, cinnamon, cinchona, fennel, clove, Ginger, Nuxvomica & ipecacuanha.

BIOCHEMISTRY AND CLINICAL PATHOLOGY

Introduction to biochemistry. Brief chemistry and role of proteins, polypeptides and amino acids, classification, Qualitative tests, Biological value, Deficiency diseases.

Carbohydrates: Brief chemistry and role of carbohydrates, classification, qualitative tests, Diseases related to carbohydrate metabolism.

Lipids: Brief chemistry and role of lipids, classification and qualitative tests. Diseases related to

lipid metabolism.

Vitamins: Brief chemistry and role of vitamins and coenzymes. Role of minerals and water in life processes.

Enzymes: Brief concept of enzymatic action. factors affecting it.

Therapeutics: Introduction to pathology of blood and urine. Lymphocytes and platelets, their role in health and disease. Erythrocytes-Abnormal cells and their significance. Abnormal constituents of urine and their significance in diseases.

HUMAN ANATOMY AND PHYSIOLOGY

Scope of Anatomy and physiology. Definition of various terms used in Anatomy. Structure of cell, function of its components with special reference to mitochondria and microsomes.

Elementary tissues: Elementary tissues of the body, i.e. epithelial tissue, muscular tissue, connective tissue and nervous tissue.

Skeletal System: Structure and function of Skeleton. Classification of joints and their function. Joint disorders.

Cardiovascular System: Composition of blood, functions of blood elements. Blood group and coagulation of blood. Brief information regarding disorders of blood. Name and functions of lymph glands. Structure and functions of various parts of the heart. Arterial and venous system with special reference to the names and positions of main arteries and veins. Blood pressure and its recording. Brief information about cardiovascular disorders.

Respiratory system: Various parts of respiratory system and their functions, physiology of respiration.

Urinary System: Various parts of urinary system and their functions, structure and functions of kidney. Physiology of urine formation. Patho-physiology of renal diseases and edema.

Muscular System: Structure of skeletal muscle, physiology of muscle contraction. Names, positions, attachments and functions of various skeletal muscles. physiology of neuromuscular junction.

Central Nervous System: Various parts of central nervous system, brain and its parts, functions and reflex action. Anatomy and physiology of automatic nervous system.

Sensory Organs: Elementary knowledge of structure and functions of the organs of taste, smell, ear, eye and skin. Physiology of pain.

Digestive System: names of various parts of digestive system and their functions. structure and functions of liver, physiology of digestion and absorption.

Endocrine System: Endocrine glands and Hormones. Location of glands, their hormones and functions. pituitary, thyroid. Adrenal and pancreas

Reproductive system: Physiology and Anatomy of Reproductive system.

HEALTH EDUCATION AND COMMUNITY PHARMACY

Concept of health: Definition of physical health, mental health, social health, spiritual health determinants of health, indicator of health, concept of disease, natural history of diseases, the disease agents, concept of prevention of diseases.

Nutrition and health: Classification of foods, requirements, diseases induced due to deficiency of

proteins, vitamins and minerals-treatment and prevention.

Demography and family planning: Demography cycle, fertility, family planning, contraceptive methods, behavioral methods, natural family planning methods, chemical methods, mechanical methods, hormonal contraceptives, population problem of India.

First aid: Emergency treatment in shock, snake-bite, burns, poisoning, heart disease, fractures and resuscitation methods, Elements of minor surgery and dressings.

Environment and health: Source of water supply, water pollution, purification of water, health and air, noise, light-solid waste disposal and control-medical entomology, arthropod borne diseases and their control. rodents, animals and diseases.

Fundamental principles of microbiology: Classification of microbes, isolation, staining techniques of organisms of common diseases.

Communicable diseases: Causative agents, mode of transmission and prevention. Respiratory infections- chicken pox, measles, influenza, diphtheria, whooping cough and tuberculosis.

Intestinal infection-poliomyelitis, Hepatitis, cholera, Typhoid, food poisoning, Hookworm infection.

Arthropod borne infections-plague, Malaria, filariases.

Surface infection-Rabies, Trachoma, Tetanus, Leprosy.

Sexually transmitted diseases-Syphilis, Gonorrhoea, AIDS.

Non-communicable diseases: causative agents, prevention, care and control.

Epidemiology: Its scope, methods, uses, dynamics of disease transmission. Immunity and immunization: Immunological products and their dose schedule. Principles of disease control and prevention, hospital acquired infection, prevention and control. Disinfection, types of disinfection procedures, for-faces, urine, sputum, room linen, dead-bodies, instruments.

PHARMACEUTICS (Dispensing Pharmacy)

Prescriptions-Reading and understanding of prescriptions; Latin terms commonly used (Detailed study is not necessary), Modern methods of prescribing, adoption of metric system. Calculations involved in dispensing.

Incompatibilities in prescriptions- study of various types of incompatibilities-physical, chemical and therapeutic.

Posology- Dose and dosage of drugs, factors influencing dose, calculations of doses on the basis of age, sex, surface area and veterinary doses.

Dispensed Medications: (Note: A detailed study of the following dispensed medication is necessary. Methods of preparation with theoretical and practical aspects, use of appropriate containers and closures. special labeling requirements and storage conditions should be highlighted).

Powders-Type of powders-Advantages and disadvantages of powders, Granules, cachets and tablet triturates. preparation of different types of powders encountered in prescriptions. Weighing methods, possible errors in weighing, minimum weighable amounts and weighing of a material below the minimum weighable amount, geometric dilution and proper usage and care of dispensing balance.

Liquid oral Dosage forms:

Monophasic-Theoretical aspects including commonly used vehicles, essential adjuvant like stabilizers, colorants and flavors, with examples.

Review of the following monophasic liquids with details of formulation and practical methods. Liquids for internal administration Liquids for external administration or used on mucous membranes

Mixtures and concentrates, Gargles

Syrups Mouth washes

Throat-paints

Elixirs

Douches

Ear Drops

Nasal
drops
Lotions.

Sprays

Liniments

Biphasic Liquid Dosage Forms:

Suspensions (elementary study)-Suspensions containing diffusible solids and liquids and their preparations. Study of the adjuvant used like thickening agents, wetting agents, their necessity and quantity to be incorporated ,suspensions of precipitate forming liquids like tinctures, their preparations and stability. suspensions produced by chemical reaction. An introduction to flocculated /non-flocculated suspension system.

Emulsions-Types of emulsions, identification of emulsion system, formulation of emulsions, selection of emulsifying agent. Instabilities in emulsions, preservation of emulsions.

Semi-Solid Dosage Forms:

Ointments: Types of ointments, classification and selection of dermatological vehicles. Preparation and stability of ointments by the following processes:

Trituration

fusion

chemical reaction

Emulsification.

Pastes: Differences between ointments and pastes, Bases of pastes. preparation of pastes and their preservation .

Jellies: An introduction to the different types of jellies and their preparation. An elementary study of poultice.

Suppositories and pessaries-Their relative merits and demerits, types of suppositories, suppository bases, classification, properties, preparation and packing of suppositories. Use of suppositories of drug absorption.

Dental and cosmetic preparations: Introduction to Dentifrices, facial cosmetics, Deodorants. Antiperspirants, shampoo, Hair dressings and Hair removers.

Sterile Dosage forms:

Parenteral dosage forms-Definition, General requirements for parenteral dosage forms. Types of parenteral formulations, vehicles, adjuvant, processing and personnel, Facilities and quality control. Preparation of Intravenous fluids and admixtures-Total parenteral nutrition, Dialysis fluids.

Sterility testing: particulate matter monitoring- Faculty seal packaging.

Ophthalmic products: study of essential characteristics of different ophthalmic preparations. Formulation: additives, special precautions in handling and storage of ophthalmic products.

PHARMACEUTICAL CHEMISTRY

1. Introduction to the nomenclature of organic chemical systems with particular reference to hetero-cyclic system containing up to 3 rings.
2. The chemistry of following pharmaceutical organic compounds covering their nomenclature, chemical structure, uses and the important physical and chemical properties(chemical structure of only those compounds marked with asterisk (*). The stability and storage conditions and the different type of pharmaceutical formulations of these drugs and their popular brand names.

Antiseptics and Disinfectants-Proflavine*, Benzalkonium chloride, Cetrinide, Phenol, chloroxylenol, Formaldehyde solution, Hexachlorophene, Nitrofurantoin.

Sulphonamides-Sulphadiazine, Sulphaguanidine, Phthalylsulphathiazole, Succinylsulphathiazole, Sulphadimethoxine, Sulphamethoxyipyridazine, Co-trimoxazole, sulfacetamide*

Antileprotic Drugs- Clofazimine , Thiambutosine, Dapsone* , solapsone,

Anti-tubercular Drugs- Isoniazid*, PAS*, Streptomycin, Rifampicin, Ethambutol*, Thiacetazone, Ethionamide, cycloserine, pyrazinamide*.

Antimoebic and Anthelmintic Drugs- Emetine, Metronidazole, Halogenated hydroxyquinolines, Diloxanide furoate, Paromomycin , Piperazine*, Mebendazole ,D.E.C.*

Antibiotics- Benzyl penicillin*, Phenoxy methyl penicillin*, Benzathine penicillin, Ampicillin*, Cloxacillin, Carbencicillin, Gentamicin, Neomycin, Erythromycin, Tetracycline, Cephalexin, Cephaloridine, Cephalothin, Griseofulvin, Chloramphenicol.

Antifungal agents- Udecylenic acid, Tolnaftate, Nystatin, Amphotericin, Hamycin.

Antimalarial Drugs-Chloroquine*,Amodiaquine, Primaquine, Proguanil, Pyrimethamine*, Quinine, Trimethoprim.

Tranquilizers-Chlorpromazine*,Prochlorperazine,Trifluoperazine, Thiothixene,Haloperidol*, Triperiodol, Oxypertine, Chlordizepoxide, Diazepam*, Lorazepam, Meprobamate.

Hypnotics-Phenobarbitone*,Butobarbitone, Cylobarbitone, Nitrazepam, Glutethimide*, Methypylon, Paraldehyde, Triclofosodium.

General Anaesthetics-Halothane*, Cyclopropane*, Diethyl ether*, Methohexital sodium, Thiopecal sodium, Trichloroethylene .

Antidepressant Drugs- Amitriptyline, Nortriptyline, Imperamine*, Phepelzine, Tranylcypramine.

Analeptics- Theophylline, Caffeine*, Coramine*, Dextro-amphetamine.

Adrenergic drugs- Adrenaline*, Noradrenaline, Isoprenaline*, Phenylephrine, Salbutamol, Terbutaline,Ephedrine*, Pseudoephedrine.

Adrenergic antagonist- Tolazoline, Propranolol*, Practolol.

Cholinergic Drugs- Neostigmine*, Pyridostigmine, Pralidoxime, Pilocarpine, Physostigmine*.

Cholinergic Antagonists- Atropine*, Hyoscine, Homatropine, Propantheline*, Benztropine, Tropicamide,Biperiden*.

Diuretic Drugs- Furosemide*, Chlorothiazide, Hydrochlorothiazide*, Benzthiazide, Urea*, Mannitol*,Ethacrynic Acid.

Cardiovascular Drugs- Ethylnitrite*, Glyceryl trinitrate, Alpha methyl dopa, Guanethidine, Clofibrate,Quinidine.

Hypoglycemic Agents- Insulin, Chlorpropamide*, Tolbutamide, Glibenclamide, Phenformin*, Metformin. **Coagulants and Anti coagulants-** Heparin, Thrombin, Menadione*, Bisphydroxycoumarin, Warfarin sodium.

Local Anaesthetics- Lignocaine*, Procaine*, Benzocaine,

Histamine and anti Histaminic Agents- Histamine, Diphenhydramine*, Promethazine, Cyproheptadine, Mepyramine*, Pheniramine, Chlorpheniramine*,

Analgesics and Anti-pyretics-Morphine, Pethidine, Codeine, Methadone, Aspirin*, Paracetamol, Analgin,Dextropropoxyphene, Pentazocine.

Non-steroidal anti-inflammatory agents- Indomethacin*, Phenylbutazone*, Oxyphenbutazone, Ibuprofen.

Thyroxine and Antithyroids- Thyroxine*, Methimazole, Methyl thiouracil, Propylthiouracil.

Diagnostic Agents- Lopanoic Acid, Propylidone, Sulfobromophthalein-sodium, Indigotindisulfonate, Indigo Carmine, Evans blue, Congo Red, Fluorescein sodium.

Anticonvulsants, cardiac glycosides, Antiarrhythmic, Antihypertensives & Vitamins.

Steroidal Drugs- Betamethasone, Cortisone, Hydrocortisone, Prednisolone, Progesterone, Testosterone, Oestradiol, Nandrolone.

Anti-Neoplastic Drugs- Actinomycin, Azathioprine, Busulphan, Chlorambucil, Cisplatin, Cyclophosphamide, Daunorubicin Hydrochloride, Fluorouracil, Mercaptopurine, Methotrexate, Mytomycin.

PHARMACOLOGY & TOXICOLOGY

Introduction to Pharmacology, Scope of Pharmacology.

Routes of administration of drugs, their advantages and disadvantages. Various processes of absorption of drugs and the factors affecting them. Metabolism, distribution and excretion of drugs.

General mechanism of drugs action and their factors which modify drugs action. Pharmacological classification of drugs. The discussion of drugs should emphasize the following aspects:

Drugs acting on the central Nervous system:

General anaesthetics- adjunct to anaesthesia, intravenous anaesthetics. Analgesic antipyretics and non-steroidal

Anti-inflammatory drugs- Narcotic analgesics. Antirheumatic and anti-gout remedies.

Sedatives and Hypnotics, psychopharmacological agents, anticonvulsants, analeptics. Centrally acting muscle relaxants and anti-parkinsonism agents. Local anesthetics.

Drugs acting on autonomic nervous system.

Cholinergic drugs, Anticholinergic drugs, anticholinesterase drugs. Adrenergic drugs and adrenergic receptor blockers.

Neurone blockers and ganglion blockers. Neuromuscular blockers, used in myasthenia gravis.

Drugs acting on eye: Mydriatics, drugs used in glaucoma.

Drugs acting on respiratory system, Respiratory stimulants, Bronchodilators, Nasal decongestants, Expectorants and Antitussive agents.

Autocoids: physiological role of histamine and serotonin, Histamine and Antihistamines, prostaglandins.

Cardio vascular drugs

Cardiotonics, Antiarrhythmic agents, Anti-anginal agents, Antihypertensive agents, peripheral Vasodilators and drugs used in atherosclerosis.

Drugs acting on the blood and blood forming organs. Haematinics, coagulants and anticoagulants, Haemostatic , Blood substitutes and plasma expanders.

Drugs affecting renal function- Diuretics and anti-diuretics.

Hormones and hormone antagonists- Hypoglycemic agents, Anti--thyroid drugs, sex hormones and oral contraceptives, corticosteroids.

Drugs acting on digestive system-carminatives, digest ants, Bitters, Antacids and drugs used in pepticulcer, purgatives and laxatives, Anti-diarrohoeals, Emetics, Anti-emetics, Antispasmodics.

Chemotherapy of microbial diseases:

Urinary antiseptics, sulphonamides, penicillin, streptomycin, Tetracyclines and other antibiotics. Anti- tubercular agents, Antifungal agents, antiviral drugs, anti-leprotic drugs. Chemotherapy of protozoal diseases, Anthelmintic drugs. Chemotherapy of cancer.

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The Drugs and Magic Remedies (objectionable Advertisement)Act, 1954-General study of the Act, objectives , special reference to be laid on Advertisements, magic remedies and objections¹ and permitted advertisements -diseases which cannot be claimed to be cured.

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Introduction-Trade, Industry and commerce, Functions and subdivision of commerce, Introduction to Elements for Economics and Management. Forms of Business Organizations. Channels of Distribution.

Drug House Management-selection of site, space Lay-out and legal requirements. Importance and objectives of purchasing, selection of suppliers, credit information, tenders, contracts and price determination and legal requirements thereto. Codification, handling of drug stores and other hospital supplies. Inventory Control-objects and importance, modern techniques like ABC,VED analysis, the lead time, inventory carrying cost, safety stock, minimum and maximum stock levels, economic order quantity, scrap and surplus disposal.

Sales promotion, Market Research, Salesmanship, qualities of a salesman, Advertising and Window Display.

Recruitment, training, evaluation and compensation of the pharmacist.

Banking and Finance-Service and functions of bank, Finance planning and sources of finance.

HOSPITAL AND CLINICAL PHARMACY

Hospital-Definition, Function, classifications based on various criteria,organization, Management and health delivery system in India.

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Sterile manufacture-Large and small volume parenterals, facilities, requirements, layout production planning, man-power requirements.

Non-sterile manufacture-Liquid orals, externals, Bulk concentrates. Procurement of stores and testing of raw materials.

Nomenclature and uses of surgical instruments and Hospital Equipments and health accessories.

Hospital Formulary system and their organization, functioning, composition.

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Surgical dressing like cotton, gauze, bandages and adhesive tapes including their pharmacopoeial tests for quality. Other hospital supply eg. I.V.sets, B.G. sets, Ryals tubes, Catheters, Syringes etc.

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Common daily terminology used in the practice of Medicine.

Disease, manifestation and patho-physiology including salient symptoms to understand the disease like Tuberculosis, Hepatitis, Rheumatoid Arthritis, Cardio-vascular diseases, Epilepsy, Diabetes, Peptic Ulcer, Hypertension.

Physiological parameters with their significance.

Drug Interactions: Definition and introduction. Mechanism of Drug Interaction. Drug-drug interaction with reference to analgesics, diuretics, cardiovascular drugs, Gastro-intestinal agents. Vitamins and Hypoglycemic agents. Drug-food interaction.

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Drugs in Clinical Toxicity- Introduction, general treatment of poisoning, systemic antidotes, Treatment of insecticide poisoning, heavy metal poison, Narcotic drugs, Barbiturate, Organophosphorus poisons.

Drug dependences, drug abuse, addictive drugs and their treatment, complications.

Bio-availability of drugs, including factors affecting it.

SYLLABUS FOR THE POST OF PHYSIOTHERAPIST

Subject Knowledge (100 Marks):

A. Anatomy (10 Marks):

- General and Applied anatomy.
- Musculoskeletal system – Connective tissue & its modification, tendons, membranes, special connective tissue.
- Bone structure, blood supply, growth, ossification, and classification.
- Muscle classification, structure and functional aspect.
- Joints – classification, structures of joints, movements, range, limiting factors, stability, blood supply, nerve supply, dislocations and applied anatomy.
- Central nervous system – disposition, parts and functions
- Cardiovascular system
- Lymphatic system
- Respiratory system
- Digestive system
- Urinary and Reproductive system
- Endocrine system

B. Physiology (10 Marks):

- General Physiology
- Blood
- Cardiovascular system
- Respiratory System
- Nerve Muscle Physiology
- Nervous system
- Renal System
- Digestive System
- Endocrinology

C. Fundamentals of Occupational Therapy (10 Marks):

- History & development of Occupational Therapy

D. Rehabilitation (10 Marks)

E. Occupational performance model Generalized & specific principles of therapeutic exercises (10 Marks)

F. Therapeutic modalities (10 Marks)

G. Principles & methods of testing range of motion & muscle strength. Testing methods of sensation, perception, coordination and muscle tone (10 Marks)

H. Human development and its importance in occupational therapy. General principles of human maturation (10 Marks)

I. Activities of daily living Occupational therapy as diagnostic & prognostic procedure. Steps involved in preparing the client for return to work. (10 Marks)

J. Prevocational evaluation (10 Marks):

- Evaluation of work capacity, Evaluation of physical Capacity, Evaluation of functional capacity on the job or work site evaluation
- Work samples such as TOWER, BTE, WEST
- Work hardening & work conditioning
- Different types of tools & equipment's & their uses in
- Occupational Therapy
- Define & classify splints with their brief description, state general principles of splinting, describe material used. Hand function & evaluation methods

SYLLABUS FOR THE POST OF PLUMBER

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- Instruction to safety precautions on the shop floor
- Hardening and tempering of chisels
- Measurements wire gauge and sheet gauge
- Cutting of sheet metal of size

- Various tools and usage such as wrenches, spanners, caulking tools, stocks and dies etc.
- Leak proof joints for all types of pipes
- Knowledge of materials that go to form joints and be able to estimate requirements.
- Overhauling of bibcock's, ball valves, sluice valves including grinding and seating
- Preparation of sheet metal articles involving development
- Forming of rolls, welts corners & slashing in sheet.
- Joining of copper & Zinc of solids, hollow & conical roll.
- Erection of simple sen folding
- Marking for excavation
- Cement joining of pipes
- Joining of copper tubes :
 - Using can type compression fittings
 - Using ring type compression fittings.
 - Using capillary fittings.
- Butt and branch welds on M.S. pipes.
- Bronze welding
- Copper sheet
- Copper tubes
- Brass tubes to copper
- Installation meters.
- Gas meter
- Compound meter
- Hot water meter
- Joining practice on zinc and copper pipes
- Installation of gas piping
- Connection of gas meter
- Installation of gas appliances
- Use, care and maintenance of lifting tackle.
- Use of synthetic pipes e.g. polythene etc. and preparation of joints.
- Installation of bidet
- Trouble shooting
- Joining of cable line

Workshop Calculation and Science

- Algebra: Addition subtraction, multiplication and division of expressions involving algebraic symbols. Simple equations and transposition problems. Standard algebraic formula e.g. $(a+b)$ $(a-b)$ etc. simple simultaneous equation with two unknown quantities.
- Mensuration: Areas of rectangles, squares, triangles, circle and regular polygons, calculation of area, volume and eight of simple solid bodies such as cube spheres hexagonal prisms etc. problems.
- Trigonometry: Trigonometric functions. Use of trigonometric tables, applied problems. Calculation of areas of triangles, polygons etc.
- Further problems as applicable to the trade.
- Estimation preparation of estimates & specification.
- Meaning of ten city elasticity malleability, brittleness, hardness compressibility & ductility.
- Meaning of stress, strain, modulus of elasticity ultimate tensile strength, factor of safety and different types of stresses.
- Velocity and acceleration.
- Definition of mechanical advantage of simple machines pulleys
- Determination of diameters, length and weight of pipes. Calculation of requirement of

materials for the preparation of estimates. Head of water, water pressure per unit area, rate of flow and volume of water discharged.

- Description explanation of expansion of solids, liquids and gases due to heat, coefficient of expansion. Brief description of transference of heat-conduction, convection and radiation.
- Heat and temperature. Thermometric scales, Fahrenheit and Celsius/centigrade scales, conversion of Fahrenheit to centigrade I Celsius scale and vice-versa. Measurement of temperature. Name and brief description of temperature measuring instruments used in the workshop.

Engineering Drawing

- Advance blue print reading
- Code of practice for general engineering drawing according to ISI (IS: 969)
- Development of surface of simple objects related to the trade.
- Construction of Isometric scale.
- Free hand sketching and production of working drawing of simple parts such as pipe joints, taps, valves etc.
- Free hand sketching and preparation of layout drawings of various plumbing details of buildings.
- Social Studies

SYLLABUS FOR THE POST OF PRIVATE SECRETARY

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (20 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (20 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (20 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

PART-II

Skill Test in Stenography:

The Skill Test will be of qualifying nature. Candidates will have to qualify the test for English or Hindi at the prescribed speed on Computer as per the advertisement.

SYLLABUS FOR THE POST OF PUBLIC HEALTH NURSE

Subject Knowledge (100 Marks):

A. ANATOMY AND PHYSIOLOGY

- Bones: Types, Structures, Function
- Joints: Classification, Structure and Function
- Blood: Composition, clotting and blood group, cross matching. Blood products and their use.
- Heart: Position, Structure, conduction system, Function and cardiac cycle.
- Normal respiration and its deviations.
- Metabolism: meaning and metabolism of food constituents.
- Regulation of body temperature.
- Fluid and electrolyte balance.
- Central Nervous System: Structure and functions.
- Autonomic Nervous System: Structure and functions
- Structure and functions of pituitary, pancreas, thyroid parathyroid, thymus and supra renal glands.
- Physiology of vision, hearing and equilibrium.
- Process of reproduction, menstrual cycle and menopause

B. MICROBIOLOGY

- Pathogenic and non- pathogenic organisms.
- Portals of entry and exit of microbes
- Transmission of infection
- Collection of specimens
- Types of immunity
- Hypersensitivity and autoimmunity
- Sterilization: dry heat, moist heat, chemicals and radiation
- Disinfection: Physical, natural, gases, chemicals used and preparation of lotions
- Bio-safety and waste management

C. SOCIOLOGY

- Social problems: unmarried mothers, dowry system, prostitution, drug addiction, alcoholism, delinquency, handicapped, child abuse, women abuse.

D. NURSING FOUNDATIONS

Basic Needs and Care in Special Conditions

- Care of patient with fever, unconscious patient, patient with fluid imbalance, patient with dyspnoea.
- Care of terminally ill patient.
- Care of physically handicapped.

Dying Patient:

- Signs and symptoms of approaching death, needs of the dying patient and his relatives, care of the dying, last offices, packing of dead bodies in non-communicable and communicable diseases.

DRUG ADMINISTRATION

- Classification Administration & General action of drugs.
- Nursing implications in administration of drugs

First Aid in Emergency Situations

- Fire, burn, fracture, accidents, poisoning, drowning, hemorrhages, insect bites, foreign bodies.
- Transportation of the injured

E. COMMUNITY HEALTH NURSING-I

- Dimensions of health.
- Health determinants.
- Indicators of health
- Levels of health care
- Evolution and development of community health nursing in India and its present concept.
- Family health services- Maternal, child care and family welfare services.
- Water borne disease.
- Water purification
- Nurse's Role in National Health Programmes

F. NUTRITION

- Method of calculating normal food requirements, influence of age, sex and activity.
- Commercially prepared food and its adulteration.
- Nutritional needs for special groups, infants, children, pregnant woman, lactating mothers, old people etc.
- Methods of improving an ill-balanced diet.

G. MEDICAL SURGICAL NURSING

- Graft versus host disease.
- Fluid and electrolyte imbalance and their therapeutic management
- Therapeutic approaches to pain.
- Anaesthesia: classification, anesthetic and role of a nurse in anaesthesia.
- Post-operative complications: observation, prevention and management
- Management of patient with impaired respiratory functions.
- Respiratory intensive care.
- Management of endocrinal disorders.
- Renal failure and dialysis
- Management of patient with neurological dysfunction.
- Health problems in elderly
- Medical surgical emergencies.
- Classification of Cancer, Detection, prevention, Treatment modalities (Chemotherapy, Radiation)
- Infestations, infectious and non-infectious diseases and their management
- Burn and its management.
- Diseases and disorders of eyes, nose and throat and their management.
- Management of patients with cardio-vascular disease.
- Management of patient in ICU AND C.C.U
- Management of patient with cardio-vascular surgery.
- Adverse blood transfusion reaction and their management.
- Management of various infectious diseases.
- Disorders and diseases of bone, muscle, cartilage, ligaments and their management.

- Nursing Management of Patients with Sexually transmitted diseases

H. PSYCHIATRIC NURSING

- Definition of terms used in psychiatry.
- Trends in psychiatric nursing.
- Prevention of mental illness (Preventive Psychiatry) during childhood, adolescence, adulthood and old age.
- Classification of mental disorder.
- Schizophrenic disorders.
- Mood (affective) disorders.
- Main Depressive Psychosis.
- Anxiety states.
- Phobic disorders, obsessive compulsive disorders, depressive neurosis, conversion disorders, dissociative reaction, hypochondriasis, psychoactive disorders, alcohol, drugs and other psychoactive substance abuse.
- classification of drugs, antipsychotic, antidepressant, antimanic, antianxiety agents and Role of nurses in psychopharmacology
- Types of therapies: individual and group therapy, behavior therapy, occupational therapy and Role of the nurse in these therapies.
- Psychiatric Emergencies and Crisis Intervention
- Forensic Psychiatry / Legal Aspects

I. MIDWIFERY AND GYNAECOLOGICAL NURSING

- Embryology and foetal development
- Physiological changes in pregnancy.
- Diagnosis of pregnancy: history, signs and symptoms and investigations.
- Influence of hormones.
- Prenatal care: objectives, history taking, calculation of expected date of delivery, routine examinations.
- Management of women in Labour
- Complications of Pregnancy and its management
- High Risk Pregnancy and its management
- High Risk labour and its management
- Fertility and Infertility

J. PAEDIATRIC NURSING

- Characteristics of New Born and Physiologic status of the new born.
- Emerging challenges, nursing process related to paediatric nursing.
- Concept of preventive paediatrics.
- High risk new born
- Growth and development: Definition, principles, factors affecting growth and development, techniques of assessment of growth and development, importance of learning about growth and development of all age group
- Nursing interventions and adaptations in nursing care of sick child
- Care of Children with congenital defects / mal formations
- Children with various systemic and functional disorders

SYLLABUS FOR THE POST OF PUBLIC RELATION OFFICER

A. General Aptitude (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & un-folding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (10 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

D. Hindi Language and Grammar (10 Marks)

E. Subject Knowledge (60 Marks):

Principles of Communication and Public Relations

WHAT IS COMMUNICATION?

Definitions – Elements of Communication, Nature, Role and Scope of Communication, Communications, Public opinion and Democracy, Communication mass media and Socio-economic development.

METHODS OF COMMUNICATION:

Face to face Communication, Group Communication, Mass Communication-Spoken, Written, Un-Spoken and Unwritten, Present state of Communication in India.

MASS COMMUNICATIONS AND MASS MEDIA:

Marshal McLuhan's theory-the Medium is the message, One-step, two-step, multi-step flow of Communication, Mass Media and its characteristics

What is Communication research?

The nature and task of Communication research.

PRINCIPLES OF PUBLIC RELATIONS:

What is Public Relations? Meaning and Definitions, Basic elements of PR, Nature, role and scope, PR as a tool of modern management – PR role in the Indian Setting-Developing economy.

PR as distinct form other forms of Communication, PR and Publicity, Lobbying, Propaganda, Sales Promotion, and Advertising, PR and Corporate Marketing Services.

Historical Perspective-Industrial revolution-the beginnings of PR – Pioneers-Ivy Lee in America

– Technological and media revolution in the Society- PR during First and Second World Wars

– The Development of Indian PR, Early Phase, Professionalism, Genesis and Growth of PRSI

– Present status and

Future of PR in India.

Public Opinion – Meaning and Definition- Opinion Leaders-Individuals Institution, Roots of public attitudes – Culture, the family, religion, Economic and

Social Classes – Role of PR in opinion formation-persuasion.

The Ethics of PR – Social Responsibility Code of Professional Standards for the practice of PR

– IRSI – Code of Ethics.

Public Relations Media

MEDIA CLASSIFICATION:

Introduction to Mass Media, Functions of Mass Media, Characteristics, Limitations, advantage and relative appeal of different media.

NEWS-PAPERS AND MAGAZINES:

Principal categories of newspapers and periodicals, News Agencies, Government and Press – Mass Media as Social Instruments.

RADIO BROADCASTING:

Ratio in India, Relative coverage and appeal of Radio and Press. Impact of Radio on rural India and rural development.

TV IN INDIA:

A brief history of Television – Coverage, present status and impact on masses, Role of Satellite Communication, TV for Socio-Economic change, the future of Television in India.

FILM IN INDIA:

Film as a tool of PR, Impact of films, Documentaries, PR Films, Feature Films, Script writing of newsreel and documentaries.

PHOTOGRAPHS:

The Camera as a tool of PR, Uses of Photos in PR, News-photos, Photo features-photo Editing, Caption writing.

EXHIBITIONS:

Exhibition as a PR tool, Types of Exhibitions, Planning an Exhibition-Theme and Display.

MEDIA RELATIONS:

-Strategy for good media relations, Inter-Media Publicity, Press Conference.

-Traditional Media as a PR tool – Types – Advantages - Role of traditional Media in rural India.

-Outdoor media as a PR tool – Hoardings – Posters – Transit media – Bus panels – Neon signs – Direct Mail – advantages.

-The Art of News writing – What is News, Difference between newspapers writing and broadcast writing, Language, content and style.

-Writing for Newspapers and House Journals - Reporting – How to write a press release, Press release – Its parts, headline, sub-headlines, the lead, paragraphs, essentials of writing a press release.

-Feature writing, corporate features- Development-stories.

-Editorial Writings: House Journal's Editorials, Writing for Radio & TV.

Public Relations Practice

PUBLIC RELATIONS PRACTICE:

Scope of the Practice ; Profile of the practitioner ; Planning for Public Relations; Measuring Public Relations Objectives ; Organizing Public Relations

Department;- Organizing Public Relations Agency.

PUBLIC RELATIONS SPECIALISATION:

Public Relations in Employee Relations ; Public Relations in Industrial Relations ; Public Relations and the Community ; Public Relations and the Govt. ;

Public Relations in Promotion of causes and Ideas.

SYLLABUS FOR THE POST OF RADIOGRAPHIC TECHNICIAN GRADE I

A. General Intelligence and Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Anatomy and Physiology (10 Marks):

- Structure of the body–cells, tissues. Musculoskeletal System: Skull, Vertebral column, Shoulder Girdle Bones of upper extremities, Bones of lower extremities, pelvis and its muscles, Ossification.

- Cardiovascular System: Heart–blood– Arteries–Veins.
- Lymphatic System: Circulation of Lymph, Lymph glands, Thoracic duct. Digestive System: Mouth–oesophagus– stomach–small intestines large intestines spleen Liver Gall bladder Pancreas.
- Respiratory System: Nose, Larynx Trachea-Lungs Bony-case.
- Nervous System: Brain-meninges ventricles-Spinal cord and nerves.
- Eye: Structure and its function.
- Ear: Structure and function.
- Surface Anatomy and Cross–sectional Anatomy.
- Reproductive System: Female & Male organs.
- Urinary System: Kidneys, Ureters, Bladder, Prostate and Urethra.
- Skin: Structure and its function.
- Endocrine System: Pituitary gland, Penial gland, Thymus gland, thyroid and parathyroid gland, suprarenal glands

F. Dark Room Techniques (10 Marks):

- Photographic Process: Light image, Image produced by radiation, Light Sensitive materials, latent image.
- Film Material: The structure of X–ray & Imaging films, Resolving power, Grains of films, sensitivity of film, contrast of films, Type of films.
- X–ray Film Storage: Storage of unexposed films.
- Screens: Construction of intensifying screens.
- Choice of fluorescent material.
- Intensification factor, Detail, Sharpness. Speed, Screen contact, care of intensifying screens, Types of Screens. Cassettes: Cassette designs, Care of cassette, mounting of intensifying screen in the cassettes, various types of cassettes.
- Safe Light: Constituents, filter, testing. Film Processing: Constituents of processing solution and replenishes.
- Factors affecting the development. Types of developer and fixer, Factors affecting the use of fixer. Silver recovery methods.
- Film Rinsing, Washing and
- Drying: Intermediate rinse–washing and drying.
- Film Processing Equipment: Manual and Automatic processing. Dark Room Design: Outlay and materials used.
- Radiographic Image: The sharpness, contrast, detail, definition, viewing conditions & artifacts.
- Miscellaneous: Trimming, identification of films, legends, records filing, report distribution.

G. General Physics (10 Marks):

- Elementary idea of thermionic emission, Electron–idea of mass and nature of charge, Coulomb's law, Electric field, Unit of potential.
- Ohm's law, Units of resistance, potential and current, Combination of resistance in series and parallel. Fuses, Units of electric power, Earthing of electrical equipment.
- Magnetic fields, Lines of force, Field pattern due to a straight current carrying conductor, coil carrying current, electromagnet, Construction and working of galvanometer, voltmeter and ammeter, (moving coil type and moving magnet type). Heat and methods of transference of heat, condensers, Inductance and Impedance. A.C. and D.C. currents-effective current, RMS value, peak value. Electromagnetic induction – Laws, fields, influence. Transformers – Principles, construction, and uses of step down and High tension transformers.

- Diode values and their use in rectifiers solid-state rectifiers, its various rectifying circuits uses in X– ray machines, production of X–rays and their properties, X–ray tube–Stationary anode and rotating anode & therapy tubes, X–ray circuit, interlocking circuits, relay and timers.

H. Radiographic Techniques (10 Marks):

- Upper Limb: Fingers individual and as a whole hands, Carpal bones wrists, Forearm, elbow–head of radius, humerus, shoulder joint, Acromioclavicular joint, scapula, sternoclavicular joint, small joints.
- Lower Limb: Toes, foot, calcaneum & other tarsal bones, ankle joint, legs, knees, patella, fibula, femur, intercondylar notch.
- Hip & Pelvis: Hip, Neck of femur, threatre procedure, for hip pinning or reduction, pelvis, sacro-iliac joints, pubic bones, acetabulum.
- Vertebral Column: Curves, postures, relative levels atlanto, occipital region, odontoid process, Cervical spine, thoracic Inlet, Cervico, thoracic spine,
- lumbosacral spine, sacrum, coccyscoliosis, kyphosis, flexion, extension and neutral.
- Bones of the thorax: Sternum ribs. Skull: Land marks, Cranium, facial bones, maxilla, mandible, zygoma, T.M.
- joints, mastoids, petrous bones, optic foramen, sells turcica, P.N.S.
- Chest: Chest in teleradiography, chest supine & portable, Lordotic, apicogram and MMR.
- Abdomen: Preparation, indication and contraindication, acute abdomen, pregnancy abdomen for multiplicity maturity and foetal abnormality.
- Pelvirnetry.
- Soft tissue: Neck and breast.
- Emergency Radiography: Bedside radiography, O.T. Radiography.
- Radiography for age evidence: Bone age evidence.
- Dental Radiography: Occlusal view, Dental X–ray, Panoramic view.

I. Radiographic Procedures (10 Marks):

- Pathology: Definition, cell growth, cell deformities, cell damage, defence mechanism, cell repair.
- Neoplasia: Benign & Malignant including its mode of growth and metastasis.
- Radiation: Local and systemic.
- Radiotherapy techniques.
- Emergency in Radiology.
- Contrast media.
- Urinary Tract: I.V.P., Retrograde Pyelography, Cystourethrography. Presacral Insufflation.
- Biliary Tract: Oral cholecystography, I.V.C, Trans hepatic percutaneous cholangiography preoperative cholangiography – T-tube cholangiography, E.R.C.P.
- Tomography: Principle, equipment and types of movements, procedure.
- Venography:
- Splenoportovenography, Peripheral venography.
- Lymphangiography.
- Mammography and Xeroradiography.
- Radiculography.
- Dacrocystography.
- Gastro-intestinal Tract: Ba-swallow, Ba-meal upper G.I.T., Ba-meal follow throughs, Ba-Enema.
- Female Genital Tract: Hystero Salpingography, Gynecography, Placentography & Pelvimetry.
- Angiography: Carotid angiography, Femoral arteriography, Aortography, Selective angiography etc.

- CNS: Ventriculography,
- Myelography, Pneumoencephalography.
- Sialography
- Sinography
- Nasopharyngography
- Laryngography
- Bronchography
- Arthrography
- Discography

J. Radiation Physics and related equipments (10 Marks):

- Latent images formation and its processing.
- Various units used for measuring radiation—Roentgen, rad and rem. Construction of X-ray tube, X-rays—its production and properties.
- Ionization chambers, G.M. Counter and Scintillation Counter, Interaction of X-ray with matter.
- Quality and quantity of X-rays, HVT, linear absorption coefficient, Grid, Cones and Filters.
- Inverse square law, scattered radiations and appliances used to reduce it.
- II. Radioactivity
- Curie, Half-life, decay factor. Details about radium, cobalt and caesium.
- Doses—dose and dose rate, exposure dose, exit dose, surface dose, depth dose, isodose charts and their uses.
- Radiation Hazards, Protection against it, film badge, pocket ionization chamber, maximum permissible dose.
- High-tension control equipment – Diagnostic H.T. circuits, high tension generators, half wave full wave three phase, condensers discharge, contact voltage high tension switches, control and establishing equipment, tube filament supply, mains compensator mains resistance compensator. X-ray tubes – design, rating and care of X-ray tubes, practical considerations in choice of focus, inherent filtration. MAS meter elementary principles and construction, importance as check on. Radiographic results.
- Apparatus behaviour and additive tube loading, exposure timers – spring activated, synchronous motor, value (Low-tension ionization testing timer accuracy). Interlocks and safety devices. Circuits – Simple circuit diagram and illustration of sequence from mains supply to control X-ray exposure beam. Centering devices – mechanical and optical, interaction of X-rays and the body transmission in body tissues. Scattered radiation – control of scattered radiation, cones, diaphragm, single and multiple filters grid ratio in relation to KV, construction and operation, focused and non – focused, single stroke reciprocating and oscillating potter – bucky, diaphragms, cross cross grids, stationary grids, use etc.
- Production of X-ray tubes and high tension circuits for the production of control panel and control safety device and interlocks, basic principles of mega voltage X-ray machines.
- Fluoroscopy – Tube filtration, diaphragm, tilting couch screen grid and exploratory and control safety devices, compressors, protection, electrical radiographic and mechanical control, use and care of couch accessory fittings. Special equipment – body section radiography, apparatus and controls simultaneous multi section accessories specialized couches, skull table, mobile units. Image intensifiers, principles, optical systems, for viewing and recording final image electrical and x-ray supply protection, applications, including cine radiography, mass miniature radiography, special radiography, equipment for high speed serial techniques (etc.) rapid cassette changer rapid films changer, roll films, full size and miniature, biplane equipment, grids, protection, problems of processing and presentation, care and maintenance – general principle and routine use of charts supplied by manufactures, radiographic calibration procedure.
- Hospital staffing and organisation, records relating to patients and departmental statistics, professional attitude of the radiographer to patients and other members of the staff, medico

legal aspects, minimising waiting time, appointments organisation stock taking and stock keeping.

- Care of patient: - first contact with patient in the department handling of chair and stretcher patients, lifting of ill and injured patients, elementary hygiene, personal cleanliness, hygiene in relation to patients. E.g. clean linen and receptive nursing care, temperature. First Aid: - Shock, asphyxia, convulsions, artificial respiration, electric shock, burns, scalds,
- Haemorrhage, pressure point, tourniquet, fractures, splints, bandaging, foreign bodies, poisons, drug, reactions, administration of oxygen.
- Preparation of a patient for general X-ray examinations. Departmental instruction to out patients or ward staff, use of aperients, enema and colonic irrigation, flatulence and flatus causes and methods of relief, principles of catheterization and intubations, premeditation, its uses and methods, anaesthetised patients, nursing care before and after special X-ray examinations e.g. in neurological, vascular and respiratory conditions diabetic patients, special attention to food, trauma hazards.
- Preparation of patients for special x-ray examinations barium enema, barium meal, intravenous pyelography cholecystography etc. and their administration.
- Principles and aspects: - Methods of sterilization, care and identification of instruments and surgical dressings in common use, setting of trays and trolleys for various examinations etc.
- Intravenous pyelography, biopsy, elementary operating theatre produce. Drugs in department- storage, labelling checking, regulations regarding
- Contrast media- barium preparations, iodine
- Radiographic Photography:
- Photographic aspects of radiography– the fundamentals of the photographic process, light sensitive salts of silver, the photographic emulsion gelatin as suspension medium, size and frequency of the silver halide grain in relation to sensitivity and contrast, formation of the latent image, chemical development, construction of x-ray film base material, substratum coating, emulsion, coating anti-abrasive super coating sensitivity, storage of unexposed film.
- X-ray materials: - Type of emulsion, characteristics and control screen films, non-screen films, dental films, comparative speed and contrast to light and x-rays.
- Characteristics of x-ray emulsions, characteristics curves of x-ray film assessment of the results of correct exposure under & over exposure, density (D max) speed, contrast (Gamma infinity) graduation, fog, grain, exposure, kilovoltage and developing latitude. Intensifying screens
- fluorescence application of fluorescence in radiography, construction of an intensifying screen, types of emulsion in relation to type of salt, size of grain, coating, weight, kilovoltage, mounting and general care of screens, after glow test for reciprocity failure, intermittency effect. X-ray, testing a cassette for proving good screen contact, general case of cassettes. X-ray developers –
- Characteristics and detail freedom from chemical fog and staining, long life possibility of degeneration.
- Standardization of quality of developers and development – function and constituents of an x-ray developer, standardization by time and temperature development latitude, exhaustion of a developer, replenishment of developers, ultra rapid developers, combined developer and fixer, fixers and fixing, hardening agent, time of fixation, exhaustion of a fixer, electrolytic silver recovery and fixer regeneration, rapid fixers, separate hardening. Rinsing, washing and drying – objects of rinsing and washing, methods, employed, methods of drying films, processing – preparation of solutions, available water supply, nature of mixing, vessels, order of mixing solutions, filtration, making stock solutions, storage of dry chemicals, storage of solutions, processing units, hangers, care of hangers, control of temperature by heating elements and thermostat, water mixer, by refrigeration, use of ice – film quality, ultra rapid processing, tank or dish units, stop bath rinse, wetting agents, after treatment of films. Automatic processing principles, procedure and regeneration of solutions. Knowledge of Atomic Energy

- Regulatory Board (AERB) regulations and rules.

K. Specialized investigations (10 Marks):

- Computed Tomography
- Principles of CT – Basic Physics
- Recent developments, applications etc.
- Positioning in CT
- Different types of contrast materials.
- Emergency treatment.
- Radiation hazards
- Disposal of unused matter. Magnetic Resonance Imaging Principle – Physics – Techniques –
- Types of coils – Basic term used in MRI Operations, Applications, etc.
- Positioning in MRI.
- Different types of contrast materials.
- Emergency treatment.
- MRI hazards.
- Factors affecting quality of imaging. Ultrasound
- Physics – Types of ultrasound – Techniques of ultrasound scanning in different parts – positioning and filming – Principles of Doppler effect and colour Doppler.

SYLLABUS FOR THE POST OF RECEPTIONIST

A. General Intelligence & Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (10 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Basic Computer Knowledge (10 Marks):

- General Computer Processing ability in MS-Office like Word Processing, Excel, Power Point etc. & Operating Systems.
- Professional Software/Hardware System relevant to the Post.
- Any other Computer/IT related questions.

F. Subject Knowledge (60 Marks):

- (i) **Communication:-** Types of communication, Elements of communication, Communication process, Introduction to Public Relations, Communication Skills, Introduction to Aesthetics and, Audio-Visual Communication, Inter-Personal and Intra-Personal Communication, Communication with the Public authorities and Media, Mass Communication theories and Practices, Business and Managerial Communication, Language, Culture & Communication, Consumer/Patient Behaviour and Insights,
- (ii) **Knowledge of Hospital System:-** Hospital as an organization. Introduction of Hospital (Medical Services): Outpatient services, Inpatient services, Accident and Emergency Services, Trauma management and triage, Surgical Services, Intensive care unit, Coronary care unit, Organ transplant Cell, Bone marrow transplant unit, Kidney transplant unit, Dialysis unit, Day Care units, Nursing Services, Ward management including welfare and recreational facilities, Radio imaging and radiotherapy services, Hospital laboratory services, Physiotherapy Center, Blood bank and Transfusion Services, Medical stores and pharmacy services: Hospital formulary, Essential Drugs list (EDL), CSSD, Medical Records, Mortuary, Transportation (Ambulance services), Intramural, Extramural (Patient; Staff; Visitors), Patients' rights and responsibilities, Methods of Registration- fallacies/ difficulties and sample registration, Legal issues in Hospital Administration, Medico Legal Issues in Hospital, Laws governing Medical System (Drugs and cosmetics act, Consumer protection act, PCPNDT act), Hospitals of India: an introduction (Number, Type, Size, Distribution, Ownership, Utilization, Trends and problems, Government hospitals, Private hospitals, Specialized hospitals, Cancer Hospitals, AYUSH hospitals, Psychiatric hospitals, Children's hospitals, Maternity hospitals, General hospitals, District hospitals, Taluka hospitals and Municipal hospitals), Indian Red Cross society and hospitals, Medical boards, Entitlement of treatment, Inspection, Medical Superintendent's rounds, Hospital Standing orders, Exit interview and Discharge procedure, Code of medical ethics, Sick role of patients, End of life care decisions , Ethics of caring hospital dependent, Grievance redressed and complaint handling system, Settlement of disputes, Emergency services in the hospitals: Supreme Court guideline.
- (iii) **Hospital Front Desk Services: -**
Medical Billing: Prerequisites, Introduction to Healthcare, Health Insurance Models, Patient Registration Process/Data Capture, Introduction to ICD-9-CM Coding, Introduction to CPT® Coding, Introduction to HCPCS Level II Coding, Medical Necessity, Claim Forms (CMS-1500 and UB-04), Billing, A/R and Collection Concepts, Government Carriers (Medicare, Medicaid, and TRICARE), Blue Cross/Blue Shield, Commercial Insurance Carriers, Workers' Compensation, Methods of Evaluation, Included Reading Material.
Hospital Information System (HIS): National Health Program, Health scenario of India-past, present and future, Demography & Vital Statistics, Epidemiology Introduction to computer, input output devices, Processor and memory, Storage Devices, windows, MS-Word, Introduction to Excel, power-point, Operating System, Computer networks, Internet and its Applications, Application of Computers in clinical settings Medical ethics, Code of conduct, Malpractice and negligence.
Patient satisfaction: Patient experience, hospitality, service excellence, Components of Service Product, Risk and Uncertainty in Health-Care Service, Definition of patient experience, Outcomes of patient experience—for the patient, for the employees, and for the organization, Definition of service, Empowering patients by enhancing perceived control.
First aid and basic life support: Prevention of conditions leading to cardiac arrest, immediate recognition of cardiac arrest and activation of the emergency medical service system Basic life support (CPR and AED) Advanced life support and post-cardiac arrest care Chain of survival for all ages. The links in the chain are: prevention, immediate recognition and activation, early CPR and rapid defibrillation, and advanced life support with integrated post-cardiac arrest care Check the safety of the surroundings – Speak loudly to the person patting lightly on the shoulder.

Knowledge of different Government Health Schemes: Ayushman Bharat scheme, Pradhan Mantri Jan Arogya Yojana (PM-JAY), National Health Scheme, Atal Ayushman Yojna, Janani Shishu Suraksha Karyakaram (JSSK), Rashtriya Kishor Swasthya Karyakram(RKSK), Rashtriya Bal Swasthya Karyakram (RBSK), Universal Immunisation Programme, Mission Indradhanush (MI), Janani Suraksha Yojana (JSY), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), National Leprosy Eradication Programme (NLEP), National AIDS Control Programme (NACP), National Viral Hepatitis Control Program (NVHCP), National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases & Stroke (NPCDCS) etc.

SYLLABUS FOR THE POST OF SANITARY INSPECTOR GR. II

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

C. Subject Knowledge (80 Marks):

- Air Ventilation and Lightening
- Water
- Housing
- Septic Tanks
- Collection and disposal of refuse and excreta
- Disposal of the dead
- Food Sanitation
- Minor Sanitary Engineering
- Disposal of Sewage
- Drainage
- Public Health Administration
- Sanitary Laws
- Vital Statistics
- Rodent Control
- Files
- Vector Control
- First Aid
- Lice, Fleas, Ticks
- Animal Reservoirs of Disease
- Rain Water harvesting technique
- Different Water Purification Process
- Water Sanitation:
- Water: WHO's definition of environmental Sanitation. Safe and wholesome water, Sources of water, various uses of water and its need. Water borne diseases, conservation source of water, quality of water, public health aspect of very hard water, Steps of disinfection of well. Physical, chemical and biological standard for portable water sources and nature of pollution of water in large scale and small scale. Process of disinfections of water in large and small scale provisions for sanitary wells and tube wells, plumbing system and its maintenance. Water supply and storage system at the community and domestic level, Sanitary inspection of water supply, Collection and despatch of water sample for chemical arsenic and bacteriological examination, Purification of water in urban area
- Air Sanitation: Concepts and importance of adequate ventilation.

- Night Soil Disposal: Solid Waste Disposal, Liquid Waste Disposal, Night Soil Disposal, Faecal borne disease due to unsanitary disposal of night soil, Different types of latrines in use principal of construction of sanitary latrines and their uses:
 - (i) Bore hole (ii) Dug Well (iii) RCA (iv) Septic tank latrines
- Burial of Funeral Ground: Burial and cremation Ground and mass casualty Disposal
- Soil Sanitation
- Control of biological Environment: Housing Sanitation
- Occupational Health
- Disinfection & Sterilisation
- Control of Biological Environment:
 - Study on insecticides, pesticides and disinfections, Sterilisation & disinfections of different articles, various spraying equipment's, Uses of rodenticides & larvaecidals.
- Housing: Requisites of satisfactory and safe housing, sanitary standards for construction of houses and provision of utility services, Assessment of overcrowding.
- Communicable Diseases: Introduction, Terminology, Modes of disease transmission, general measures for prevention & control of communicable diseases, Role of Health Worker.
- Immunity & Immunisation: Purpose, types & effects, National Immunisation schedule for prevention of major communicable diseases- BCG, DTP, Polio, Measles & Typhoid Vaccines.
- Disinfection & Sterilisation: Effective disinfection by liquid chemical agents like Halogen, Potassium per magnate solution etc. Solid chemical agent- Bleaching Powder, Lime etc.
- Non-Communicable Diseases: Diagnosis & Prevention
- Personal Hygiene: Factors influencing health & hygiene, Health habits & practice, Maintenance of normal circulation, respiration, digestion etc., Skin care cleanliness, Dental care, Care of hands, hand washing, Exercises-importance, Food values, Nutrition
- Health Statistics: Basic knowledge of statistics, mean, medium, mode, standard deviations. Sampling Procedure, Tabulation of Data, Histogram, Ogive, Pie Chart, Bar Chart.
- Public Health Acts: Indian Epidemic Diseases Act, Purification of Air and Water Pollution Acts, Prevention of Food Adulteration act, Birth and Death Registration Act, NTP Act, Suppression of Immoral Traffic Act (SITA), Municipal and local body Acts related to housing, sanitation etc. Factory Act and Employer's State Insurance Act.
- Public Health Administration: National Filaria Control Program, National Leprosy Program, Diarrheal Disease Control Program, STD Central Program, Goiter Control Program, Blindness Control Program, Universal Immunization Program
- Behavioural Science: Factors influencing human behaviour. Change of behavioural pattern in different age groups. Interpersonal relations and defence mechanism, Learning and motivation process in behaviour, Special groups and family structure, Social Process and control.
- Health Education:
 - Elements of communication system and process, Use of audio visual aids and media, Teaching and Learning process, Planning Health Education activities, Health Education through personal contract, group meetings and indirect approaches, AIDS prevention.

SYLLABUS FOR THE POST OF SECURITY-CUM-FIRE JAMADAR

A. General Intelligence and Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern-folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving, Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

B. General Awareness (20 Marks):

Questions are designed to test the candidate's general awareness of the environment around him and its application to society. Questions are also designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspect as may be expected of an educated person. The test will also include questions relating to India and its neighbouring countries especially 10 pertaining to History, Culture, Geography, Economic Scene, General policy and scientific research.

C. Quantitative Aptitude (20 Marks):

Number Systems: Computation of Whole Number, Decimal & Fractions, Relationship between numbers

Fundamental arithmetical operations: Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.

Algebra: Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.

Geometry: Familiarity with elementary geometric figures and facts: Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.

Mensuration: Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base

Trigonometry: Trigonometry, Trigonometric ratios, Complementary angles, Height and distances (simple problems only) Standard Identities like $\sin^2\theta + \cos^2\theta = 1$ etc.

Statistical Charts: Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart

D. English Language (20 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (20 Marks):

Security and Fire related questions

SYLLABUS FOR THE POST OF SENIOR DIETICIAN (ASSISTANT FOOD MANAGER)

Subject Knowledge (100 Marks):

A. Human Physiology (10 Marks):

General principles of Physiology

The Skeleton – General Account

- The Muscular System – General Account -Types of muscles, characteristics of each, Similarities and Differences.
- Blood and Circulatory System – Blood and its composition, Functions of each constituent of blood, Blood groups, Blood transfusion and its importance, Coagulation of blood, Blood vessels, Structure and functions of heart, Blood pressure, heart rate, Cardiac output and their regulation.
- Lymphatic System – Lymph, Lymph glands and functions, Spleen – Structure and Functions.
- Respiratory System – Organs, Structure and Functions, Mechanism of Respiration, Chemical Respiration.
- Digestive System – Structure and Functions of Alimentary tract. Functions of various secretions and juices – Saliva, Gastric, Bile, Intestinal, Pancreatic. Functions of enzymes in digestion. Digestion of nutrients – Proteins, Fats, Carbohydrates. Common problems of Digestive tract – Vomiting, Constipation, Diarrhoea.
- Excretory System – Structure and Functions of (a) Kidney (b) Ureter (c) Bladder (d) Skin. Urine -Formation of urine, Composition of normal and abnormal urine. Role of excretory system in homeostasis, fluid balance, Regulation of body temperature.
- Nervous System – Structure of Nerve Cell, Fibre, Classification of Nervous System, Central Nervous System – Brain, Lobes of brain, Cerebrum, Cerebellum, Medulla oblongata, Hypothalamus. Pituitary Gland – structure, Functions, Spinal Cord – structure and functions, Autonomic and Sympathetic nervous system.
- Reproductive System – Female reproductive system – organs, structure and functions Male reproductive system– structure and functions, Menstruation, menstrual cycle, Puberty, Menarche, Menopause, Fertilization of ovum, Conception, Implantation
- Sense Organs – Eye – structure and function, Ear – structure and function, Skin -structure and function
- Glands and Endocrine System – o Liver – structure and function o Gall Bladder – structure and function o Enterohepatic circulation o Pancreas – structure and function o Endocrine system o Endocrine glands – structure and function. Hormone – types and functions, role in metabolism.
- Endocrine disorders o Regulation of Hormone Secretion

B. Biochemistry (10 Marks):

- Introduction to Biochemistry – Significance of pH, Acid-Base Balance, Cell Structure, Composition, Organelles, Membrane and Function Alterations and Significance.
- Carbohydrates – Structure and properties of Mono-saccharides, Disaccharides, Polysaccharides. Study of intermediary metabolism of carbohydrates, Glycolysis, Aerobic, Anaerobic, Tricarboxylic acid cycle, Significance of TCA cycle integrating metabolism of carbohydrates protein and lipid, Gluconeogenesis, Glycogenesis, Glycogenolysis, Hexose monophosphate shunt.

- Proteins – Structure, composition Classification and Function, Structure of important proteins with special reference to Insulin, myoglobin, and hemoglobin, Binding proteins and their functions – nutritional implications, Chemistry of amino acids, Metabolism of Proteins and amino acids – Build up of amino acid pool. Urea Cycle, Creatinine and Creatine Synthesis, Biochemical parameters and alterations in disease states and Protein malnutrition, Pregnancy, Inborn errors of metabolism.
- Lipids – Definition, Composition, Classification, Structure and Properties, Lipoproteins, Metabolism of Lipids, Oxidation of fatty acids, Unsaturated fatty acids, Metabolism of ketone bodies, Biosynthesis of fatty acids, Phosphoglycerides, Biosynthesis of cholesterol and regulation, Bile acids and their metabolism, Plasma lipoproteins – Synthesis and Metabolism, Biochemical profile, alterations and significance, Prostaglandins.
- Enzymes – Definition, Classification specificity of enzymes -Intracellular distribution, kinetics, inhibition, Factors affecting enzyme activity, Enzymes in clinical diagnosis.
- Nucleic Acids – Composition, Functions, Classification, Structure and properties of DNA and RNA, Replication and transcription of genetic information, Mechanics of DNA replication, transcription, translation, Genetic code – Protein biosynthesis, Regulation of biosynthesis recombinant DNA Technology. Breakdown of purine and pyrimidine nucleotides.
- Biological Oxidation, Electron Transport Chain, Oxidative Phosphorylation.
- Hormones– Mode of Action, Regulation of Metabolism Biochemical parameters. Endocrinological abnormalities and clinical diagnosis.

C. Food Microbiology, Sanitation And Hygiene (10 Marks):

- Introduction to Microbiology – Mold, Yeast, Bacteria, Viruses, Protozoa, General Classification Family, Genus, Species. Study of their morphology, cultural characteristics and biochemical activities. Important microorganisms in foods, general.
- Growth curve of a typical bacterial cell – Effect of intrinsic and extrinsic factors on growth of organisms, pH, water activity, O- R potential, nutritional requirements, temperature, relative humidity and gaseous environment.
- Primary sources of micro-organisms in foods – Physical and chemical methods used in the destruction of micro-organisms, pasteurization, sterilization.
- Fundamentals of control of micro- organisms in foods – Extrinsic and intrinsic parameters affecting growth and survival of organisms. Use of high and low temperature, controlling moisture as water content, freezing, freezing-drying, irradiation, and use of preservatives in food. Storage of food correct handling and techniques of correct storage, Temperatures at which growth is retarded and bacteria are killed, Storage temperatures for different commodities to prevent growth or contamination and spoilage.
- Food spoilage and contamination indifferent kinds of foods and their prevention – Cereal and cereal products, pulses and legumes, Vegetables and fruits, Meat and meat products, Eggs and poultry, Milk and milk products.
- Public health hazards due to contaminated foods – Food poisoning and infections -Causative agents, symptoms, sources and mode of transmission, foods involved, Method of prevention, Fungal toxins, Investigation and detection of food-borne disease outbreak.
- Microbes used in biotechnology – Useful micro-organisms, Fermented foods – raw material used, organisms and the product obtained, Benefits of fermentation.
- Indices of food, milk and water sanitary quality. Microbiological criteria of food, water and milk testing. Food standards, PFA, FPO, BNS, MPO, Agmark, Codex Alimentarius.
- Hygiene and its importance and application – Personal hygiene – care of skin, hair, hands, feet, teeth, Use of cosmetics and jewellery, Grooming, Uniform, Evaluation of personal hygiene, Training staff.

- Safe handling of food – Control measures to prevent food borne diseases and precautions to be taken by food handlers. Reporting of cold, sickness, boils, septic wounds etc.
- Rodents and Insects as carriers of food-borne diseases. Control techniques.
- Disinfectants, sanitizers, antiseptic and germicide. Common disinfectants used on working surfaces, kitchen equipment, dish washing, hand washing etc. Care of premises and equipment, cleaning of equipment and personal tools immediately after use, use of hot water in the washing process.
- Waste disposal, collection, storage and proper disposal from the premises.
- Legal administration and quality control, laws relating to food hygiene.

D. Human Nutrition and Meal Management (10 Marks):

- Concept and Definition of terms – Nutrition, Malnutrition, Health, Brief history of Nutritional Science.
Scope of Nutrition.
Minimum Nutritional Requirements and RDA. Formulation of RDA and Dietary Guidelines – Reference Man and Reference Woman.
- Body Composition and Changes through the Life Cycle.
- Energy in Human Nutrition – Energy Balance, Assessment of Energy Requirements.
- Proteins – Protein Quality (BV, PER, NPU), Digestion and Absorption, Factors affecting protein bio-availability including Anti nutritional factors.
- Requirements.
- Lipids – Digestion and Absorption, Intestinal resynthesis of triglycerides – Types of fatty acids, Role and nutritional significance (SFA, MUFA, PUFA, W-3)
- Carbohydrates – Digestion and Absorption. Blood glucose and Effects of different carbohydrates on blood glucose, glycaemic index.
- Dietary Fibre – Classification, Composition, Properties and Nutritional status significance.
- Minerals and Trace Elements – Physiological role, Bioavailability and Requirements.
- Vitamins – Physiological role, Bioavailability and Requirements.
- Water – Functions, Requirements.
- Nutritional requirements for different age groups with rationale. Factors affecting these requirements.
- Effect of cooking and home processing on digestibility and nutritive value of foods.

E. Community Nutrition (10 Marks):

- Improving nutritional value through different methods – germination, fermentation, combination of foods.
- Basic principles of meal planning.
- Nutritional considerations for planning meals for Adults – male and female, different levels of physical activity.
- Pregnancy and Lactation
- Feeding of young children 0 -3 years
- Old age
- Athletes
- Nutritional considerations in brief for the following: Military, naval personnel
- Astronauts and food for space travel • Emergencies such as drought, famine, floods etc.

- Concept and Scope of Community Nutrition.
- Food availability and factors affecting food availability and intake.
- Agricultural production, post-harvest handling (storage & treatment), marketing and distribution, industrialization, population, economic, regional and socio-cultural factors. Strategies for augmenting food production.
- Assessment of Nutritional status – meaning, need, objectives and importance. Use of clinical signs, anthropometry, biochemical tests, and biophysical methods. Assessment of food and nutrient intake through recall, record, weighment. Food security and adequacy of diets.
- Use of other sources of information for assessment.
- Sources of relevant statistics.
- Infant, child and maternal mortality rates.
- Epidemiology of nutritionally related diseases.
- Nutritional problems of communities and implications for public health. Common Nutritional Problems in India. Incidence – National, Regional.
- Causes: Nutritional and Non Nutritional signs, symptoms, effect of deficiency and treatment
- PEM
- Micronutrient Deficiencies Fluorosis o Correction/Improvements in Diets 6. Schemes and Programs in India to combat Nutritional Problems in India. Role of International, National and Voluntary agencies and Government departments.
- Hazards to Community Health and Nutritional status
 - Adulteration in food
 - Pollution of water, air
 - Waste management
 - Industrial effluents, sewage
 - Pesticide residue in food
 - Toxins present in food – mycotoxins etc.
- Nutrition Policy of India and Plan of Action.
- Health and Nutrition Education – Steps in planning, implementation, and evaluations. Use of educational aids – visual, audio, audio-visual, traditional media etc.

F. **Diet Therapy (30 Marks):**

- Diet Therapy and Nutritional Care in Disease
 - (v) The Nutritional Care Process
 - (vi) Nutritional Care Plan
 - (vii) Assessment and Therapy in Patient Care
 - (viii) Implementation of Nutritional Care
- Nutritional Intervention– Diet Modifications
 - (vi) Adequate normal diet as a basis for therapeutic diets
 - (vii) Diet Prescription
 - (viii) Modification of Normal Diet
 - (ix) Nomenclature of Diet Adequacy of Standard Hospital Diets
 - (x) Psychological factors in feeding the sick person
- Interactions between Drugs, Food Nutrients and Nutritional Status
- Effect of drugs on Food and Intake, Nutrient Absorption, Metabolism, and Requirements.
 - (vii) Drugs affecting intake of food and nutrients
 - (viii) Absorption
 - (ix) Metabolism and excretion

- (x) Nutritional status
- (xi) Summary of action of some common drugs
- (xii) Effect of food, nutrients and nutritional status on absorption and metabolism of drugs
 - Disease of the G. I. System – Nutritional Assessment
 - Pathogenesis of G.I. Disease with special reference to upper G. I. Tract and ulcers.
 - Diseases of esophagus and dietary care
 - Diseases of stomach and dietary care
 - Gastric and duodenal ulcers
 - Predisposing factors and Treatment
 - Brief medical therapy, rest, antacids, other drugs and dietary care
 - Food acidity, foods that cause flatulence, factors that damage G. I. Mucosa
 - Foods stimulating G. I. Secretion
 - Diet and Eating Pattern
 - Diet Recommendations
 - Liberal Approach Vs Traditional Approach
 - Possible nutritional and dietary inadequacies
 - Gastrostomy
 - Intestinal Diseases
 - Flatulence, Constipation, Irritable Bowel, Haemorrhoids,. Diarrhoea, Steatorrhoea, Diverticular disease, Inflammatory Bowel Disease, Ulcerative Colitis.
 - Treatment and Dietary Care in the above mentioned conditions.
 - Malabsorption Syndrome
 - Celiac Sprue, Tropical Sprue
 - Intestinal Brush border deficiencies (Acquired Disaccharide Intolerance)
 - Protein Losing Enteropathy
 - Dietary Care Process
 - Diet in Diseases of the Liver, Pancreas and Biliary System
 - Nutritional care in Liver disease in the context of results of specific Liver Function Tests.
 - Dietary Care & Management in Viral Hepatitis, Cirrhosis of Liver, Hepatic Encephalopathy, Wilson's disease.
 - Dietary care and management in diseases of Gall Bladder and Pancreas.
 - Biliary Dyskinesia, Cholelithiasis, Cholecystitis, Cholecystectomy, Pancreatitis, Zollinger-Ellison Syndrome.
 - Diet in Disease of the Endocrine Pancreas Diabetes Mellitus and Hypoglycaemia
 - Classification
 - Physiological symptoms and disturbances, diagnosis (FBG and OGTT)
 - Management of Diabetes Mellitus
 - Clinical Vs Chemical control
 - Hormonal Therapy
 - Oral Hypoglycemic Agents
 - Home Glucose Monitoring
 - Glycosylated Hemoglobin
 - Urine Testing
 - Exercise
 - Dietary care and Nutritional Therapy – The Diet Plan, Meal planning with and without Insulin, Special Dietetic Foods, Sweeteners and Sugar Substitutes
 - Diabetes in Pregnancy, Elderly, Surgery, Diabetic diets in Emergency, Illness, Diabetic coma, Insulin reaction, Juvenile diabetes, Patient Education in Diabetes
 - Hypoglycaemia -classification, symptoms, fasting state hypoglycaemia, Postprandial or reactive hypoglycaemia, Early alimentary and late reactive hypoglycaemia, Idiopathic hypoglycaemia, Dietary treatment in reactive hypoglycaemia.
 - Dietary care in diseases of the Adrenal Cortex, Thyroid gland and Parathyroid gland.
 - Functions of the gland and hormones and their insufficiency, metabolic implications, clinical symptoms.

- Dietary treatment as supportive together forms of therapy
- Adrenal cortex insufficiency, Hyper and Hypothyroidism (goitre), Hypoglycaemia.
- Nutritional care for Weight Management
- Regulation of energy intake and balance of body weight
- Control of appetite and food intake–
 - Neural control, hormonal control, insulin, estrogen and other peptides and hormones.
- Identifying the obese
- Types of obesity, Health risks
- Causes, Psychology of obesity, Theories of obesity, Physiology of the obese state
- Thermogenesis, Thyroid hormones
- Treatment of Obesity
- Diets in Obesity – Starvation, Fasting
- Evaluation of some common diets, Protein-sparing modified fast, High protein diets
- Balanced Energy Reduction
- Foods to include, fibre foods allowed as desired, alcohol, snacks and beverages
- Psychology of weight reduction

- Behavioural Modification –
 - Psychotherapy, pharmacology, exercise & physical activity, Surgery, prevention of weight gain & obesity.
- Underweight– Etiology and Assessment, High calorie diets for weight gain, Diet plan, Suggestions for increasing calories in the diet, Anorexia Nervosa and Bulimia
- Diseases of the Circulatory System
 - Atherosclerosis – Etiology, risk factors, diet
 - Hyperlipidemias
 - Brief review of Lipoproteins and their metabolism
 - Clinical and nutritional aspects of Hyperlipidemias
 - Classification and Dietary care of Hyperlipidemias
 - Nutritional care in Cardiovascular disease
- Ischemic heart disease Pathogenesis of sodium and water retention in Congestive Heart Disease. Acute and Chronic Cardiac Disease, Acute
- Stimulants, food & consistency, Chronic – Compensated and decompensated states, Sodium Restriction in Cardiac Diseases, Diet in Hypertension – Etiology, Prevalence, Renin-
- Angiotensin mechanism, Salt and Blood pressure, Drugs and Hypertension, Cerebrovascular diseases and diet in brief)
- Anemia
- Resulting from Acute Haemorrhage
- Nutritional anaemia
- Sickle cell anaemia
- Thalassemia
- Pathogenesis and dietary management in the above conditions
- Renal Disease
- Physiology & function of normal kidney – a brief review
- Diseases of the kidney, classification
- Glomerulo nephritis – Acute and Chronic– Etiology, Characteristics, Objectives, Principles of Dietary
- Treatment and Management
- Nephrotic syndrome – objectives, principles of Dietary Treatment and Management.
- Uremia and Renal Failure
- History, General Principles of Protein
- Nutrition in Renal Failure and Uremia.

- Acute Renal Failure– Causes, dietary management fluid, sodium and potassium balance, protein and energy requirements
- Chronic renal failure medical treatment, Renal transplants. Dialysis and types haemodialysis, Peritoneal Dialysis & Continuous Ambulatory Peritoneal Dialysis (CAPD). Dietary Management in conservative treatment, dialysis and after renal transplantation.
- Use of Sodium and Potassium
- Exchange lists in Renal (diet planning). □ Chronic renal failure in patients with diabetes mellitus
- Chronic renal failure in children
- Nephrolithiasis – Etiology, types of stones, Nutritional care, alkaline-ash diets
- Allergy
- Definitions, symptoms, mechanism of food allergy
- Diagnosis– History, Food record
- Biochemical and Immunotesting (Brief)
- Elimination diets
- Food selection □ Medications (brief)
- Prognosis food Allergy in infancy
- Milk sensitive enteropathy; Colic, Intolerance to breast milk, prevention of Food Allergy.
- Diseases of Nervous System, Behavioural Disorders and Muscular Skeletal System
- Neuritis and polyneuritis
- Migraine, headache
- Epilepsy
- Multiple sclerosis
- Hyperkinetic Behaviour Syndrome □ Orthomolecular psychiatry and mental illness (Brief) Definition, etiology, dietary treatment and prognosis in the above conditions.
- Arthritis– Rheumatoid Arthritis, Osteoarthritis, Symptoms, dietary management
- Nutrition in Cancer- Types, symptoms, detection
- Cancer therapies and treatment – side effects and nutritional implications
- Goals of care and guidelines for oral feeding
- Accommodating side effects
- Enteral tube feeding – Nasogastric, Gastrostomy, Jejunostomy
- Parenteral Nutrition
- Paediatric patients with cancer
- The terminal cancer patient
- Nutrition in Physiological Stress
- Physiological stress and its effect on body, nutritional implications.
- Fevers and infections
- Surgery and Management of Surgical Conditions
- Parenteral Nutrition – Types, mode, and composition of feeds
- Tube feeding – Routes, modes, composition, care to be taken during feeding
- Dietary guidelines
- Burns

G. Nutrition Education and Dietetic Counselling (10 Marks):

- Metabolic implications – nutritional requirement
- Management and nutritional care
- Nutritional Management of Patients with HIV, AIDS
- Nutritional Management – Counselling and Management
- Goals of care
- Timing of food presentation
- Guidelines for oral feeding anti-tumour therapy

- Accommodating taste changes
- External tube feeding
- Parenteral nutrition
- Patient co-operation
- Pediatric patients with cancer
- The terminal cancer patient
- Misconceptions in nutritional care
- Dietician as part of the Medical Team and Outreach Services.
- Clinical Information – Medical History and Patient Profile Techniques of obtaining relevant information, Retrospective information, Dietary Diagnosis, Assessing food and nutrient intakes, Lifestyles, Physical activity, Stress, Nutritional Status. Correlating Relevant Information and identifying areas of need.
- The Care Process – Setting goals and objectives short term and long term, Counselling and Patient Education, Dietary Prescription, Motivating Patients, Working with – Hospitalized patients (adults, paediatric, elderly, and handicapped), adjusting and adopting to individual needs.
- Outpatients (adults, paediatric, elderly, handicapped), patients' education, techniques and modes.
- Follow up, Monitoring and Evaluation of outcome, Home visits vii. Maintaining records, Reporting findings, Applying findings, Resources and Aids for education and counselling, Terminating counselling, Education for individual patients, Use of regional language, linguistics in communication process, Counselling and education.

H. Food Services Management (10 Marks):

- Introduction to food services and catering industry, Development of Food Service Institutions in India, Types of Services as affected by changes in the environment. ii. Hospital food service as a speciality – Characteristics, rates and services of the food production, service and management in hospitals. Role of the Food Service Manager /Dietitian.
- Organizations – Types of organizations and characteristics.
- Organizational charts.
- Catering Management Definition, Principles and Functions, Tools of Management Resources. Attributes of a successful manager.
- Approaches to Management Traditional, Systems Approach, Total Quality Management.
- Management of Resources – Capital, Space, Equipment and Furniture, Materials, Staff, Time and Energy, Procedures Physical facility design and planning. Equipment selection.
- Purchase and store room management – Purchase systems, specifications, food requisition and inventory systems, quality assurance.
- Human Resource Management
- Definition, Development and policies
- Recruitment Selection, Induction
- Employment procedures: Employee Benefits, Training and Development, Human Relations, Job description, Job specifications, Job evaluation, Personnel appraisal.
- Trade Union
- Negotiations and Settlement.

- Financial Management (in brief since there is a separate subject Food Cost and Quality Control) – Elements of Financial management, Budget Systems and accounting, Budget preparation.
- Food Production and Service Operations
- General Planning
- Preliminary planning
- Consideration of patients with specific nutritional and dietary needs, labour use and productivity.
- Flow pattern.

SYLLABUS FOR THE POST OF SENIOR HINDI OFFICER

A. General Hindi and Grammar (35 Marks)

B. General English (30 Marks):

General English Questions in this component will be designed to test the Candidate's understanding and knowledge of Hindi & English Languages and will be based on error recognition, fill in the blanks (using verbs, preposition, articles etc.), vocabulary, spellings, grammar, Sentence structure, synonyms, antonyms, sentence completion, correct use of words, phrases and idioms, ability to write language correctly, precisely and effectively.

C. Translation of small paragraphs consisting of 1-2 sentences from Hindi to English and vice versa (35 Marks):

Questions in this part should be designed to test the knowledge of translation.

SYLLABUS FOR THE POST OF SENIOR PROGRAMMER (ANALYST)

Subject Knowledge (120 Marks):

- Operating Systems: CPU Scheduling, Deadlocks, Memory Management, Security, Virtual Memory
- Threads Networks: Computer Networking Basics, WWW and HTTP, Wired LAN, Ethernet, Wireless LAN, Wi-Fi, VOIP, VLAN, Internet Protocols, Cryptography
- Database: Database Design – ER Model, Relational Model – Relational Algebra, Normalization, Integrity Constraints, SQL, Querying with SQL, PL/SQL, Transaction Recovery, Concurrency Control
- Web Applications: Web Server and Web Applications basics, HTML, DHTML, XML, Scripting, Java, events, Applets, Object Oriented Programming, Polymorphism
- Software Engineering: Software Development Life Cycle, Requirement Analysis, Software Metric, Software Project Management, Cost Benefit Analysis, Software Testing, Software Maintenance
- Compare data & workflows in an analog and digital environment
- Identify system software components
- The concept of streaming and compression of images
- Identify and construct system users, groups, profiles
- The DICOM parsing function to map DICOM fields to other DICOM fields
- The function of the Info Router software, construct rules and perform monitoring of jobs
- The IS Link software and its relationship
- CD Direct key features and functions
- The email key features and functions
- The Data Import key features and functions
- The Non-DICOM Import key features and functions
- Navigate Archive Explorer
- Select and use various tools in the display area
- Differentiate between view box layout and group layout, as well as navigate through stacked viewers.
- Utilize the Power Viewer toolsets
- Adjust parameters of MPR, and utilize its functions
- Utilize the 3D toolsets
- Define, edit, create, quantify and annotate vessel analysis
- Utilized the system's mammography toolset
- Interpret and utilize DICOM Header information
- Configure and utilize Display Protocols
- List and perform how to start and stop system processes
- Perform system check
- Monitor license status
- Daily, weekly and situational preventative maintenance procedures
- Working knowledge of Digital Dashboard
- Monitor log files
- Monitor Audit Trail events
- Life Cycle configuration and Auto delete priorities
- The RMS software agents perform
- Proficiency in troubleshooting various common issues
- How to contact Care stream Support Center, and the information to be provided for the Issue
- System Administrator Responsibilities
- Overview of Workflow – Analog vs. Digital
- Virtual Tour of Hospital
- Overview of Image Workflow
- Overview of Storage Workflow

- User Administration
- Database Administration
- Info Router
- IS Link
- Data Importing
- System Configuration
- Troubleshooting
- Knowledge of Basic and High Level Programming Languages

SYLLABUS FOR THE POST OF SOCIAL WORKER

A. General Intelligence and Reasoning (20 Marks) :

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. English Language (20 Marks) :

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

C. Subject Knowledge (80 Marks) :

Framework: Social Welfare- The concept of Social Welfare Social Welfare: Concept, need and objectives Philosophy of Social Welfare and Social work Social welfare in historical perspective Changing concepts and practices of social welfare in relation to social, economic and industrial development Changing political philosophy and its impact on social welfare Social Welfare and related terms:

(1) Social Development

(2) Social Planning and social administration

(3) Social reform

(4) Social Security

(5) Social Policy

(6) Social Action

(7) Social justice

(8) Social and welfare services

(9) Social legislation

(10) Human Rights Professional Social work an Introduction The concept of professional social work-alignment of scientific and humanitarian motives for promoting social welfare.

Framework: Social Welfare- The basic principles and values of professional social work and their relationship to the values of Indian Society Evolution of professional social work in UK, USA, Evolution of Professional Social work in India. Social work as a profession Nature and characteristics of a profession.

The basic values and Principles of professional social work Professional status of Social work in India Code of ethics for social workers

Methods of Social Work Primary Methods of Social work Secondary methods of Social work Integrated approach of social work Interface between Professional and voluntary social work

Psychology and Mental Health: Fundamentals –

Mental Health & Psychology, Psychology: Definitions and Fields, Mental Health: Meaning, Definitions, Characteristics

Developmental Sociology:

Characteristics Normal & Abnormal Behaviour: Meaning, Characteristics

Human Development: Heredity and Environment Meaning, Definition and scope of Mental Hygiene Characteristics and Importance of Mental Hygiene Aims of Mental Hygiene

Principles of Mental Hygiene Programme of Mental Hygiene

Developmental Stages

Developmental Stages I: Prenatal, Infancy

Developmental Stages II: Babyhood, Childhood

Developmental Stages III: Puberty, Adolescence, Adulthood.

Developmental Stages III: Middle age, Old age.

Personality Development

Psycho-Sexual development theory:

1. Sigmund Freud

2. Psycho Social development theory: Erick Erickson

3. Defence Mechanism

4. Perspectives of Psychopathology Unit Social Psychology Nature and scope of social psychology Attitude: nature and measurement of attitude prejudice and discrimination Communication: concept, methods, skills in communication, major obstacles Mass communication, public opinion, propaganda, fashion, social facilitation crowd behaviour.

Normal & Abnormal Behaviour: Meaning, Characteristics

Human Development : Heredity and Environment Meaning, Definition and scope of Mental Hygiene Characteristics and Importance of Mental Hygiene Aims of Mental Hygiene Principles of Mental Hygiene Programme of Mental Hygiene Developmental Stages

Developmental Stages I : Prenatal, Infancy

Developmental Stages II : Babyhood, Childhood

Developmental Stages III : Puberty, Adolescence, Adulthood.

Developmental Stages III : Middle age, Old age.

Personality Development

1. Psycho-Sexual development theory: Sigmund Freud

2. Psychosocial development theory: Erick Erickson

3. Defence Mechanism

4. Perspectives of Psychopathology Unit Social Psychology Nature and scope of social psychology Attitude: nature and measurement of attitude prejudice and discrimination Communication: concept, methods, skills in communication, major obstacles Mass communication, public opinion, propaganda, fashion, social facilitation crowd behaviour.

Sociology: Theoretical Perspective-

Conceptual & Theoretical Perspectives to Understand Society

1. Society: Nature, Approaches, Functions, Theories of Society (Evolutionary, Cyclical, Conflict and Systems theories).
2. Social Group: Concept & Characteristics of Primary Group, Secondary Group, Reference Group.
3. Social Institutions: Family, Marriage, Kinship, Property (Present trends).
4. Culture: Concept of Culture, Traditions, Customs, Values and Norms Social System and Social Process of Contemporary Society
5. Social System & Sub system: Structure & Function, Classification of System.
6. Social Structures: Status & Role.
Social Process: Meaning and kinds of Social Interaction, Socialization, Cooperation, Conflict, Assimilation, Social control.

SYLLABUS FOR THE POST OF STENOGRAPHER

PART-I

A. General Intelligence & Reasoning (20 Marks):

It would include questions of both verbal and non-verbal type. The test will include questions on analogies, similarities and differences, space visualization, problem solving, analysis, judgement, decision making, visual memory, discriminating observation, relationship concepts, arithmetical reasoning, verbal and figure classification, arithmetical number series, non-verbal series etc. The test will also include questions designed to test the candidate's abilities to deal with abstract ideas and symbols and their relationship, arithmetical computation and other analytical functions.

B. General Awareness (20 Marks):

Questions will be designed to test the ability of the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of everyday observation and experience in their scientific aspects as may be expected of an educated person. The test will also include questions relating to India and its Neighbouring countries especially pertaining to Sports, History, Culture, Geography, Economic scene, General Polity including Indian Constitution, and Scientific Research etc. These questions will be such that they do not require a special study of any discipline.

C. English Language (80 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

PART-II

Skill Test in Stenography:

The Skill Test will be of qualifying nature. The candidates will have to appear for the stenography test. The candidates will be given one dictation for 10 minutes in English/Hindi at the speed of 80 w.p.m. for the post of Stenographer.

SYLLABUS FOR THE POST OF STOREKEEPER

A. General Intelligence and Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. the topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern folding & unfolding, Figural Pattern – folding and completion, indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thing, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

50% Questions from General Awareness: Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations as may be expected of any educated person. The test will also include questions relating to India especially pertaining History, Culture, Geography, Economic Scene, General Policy.

C. Quantitative aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ration & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work.

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Material Management (80 Marks):

Introduction to Materials Management: Objectives and Advantages of Materials Management. Interfaces of Materials Management: Internal and external interfaces. Organization for Material Management. Supply Chain Management: Concept, objectives of supply – production and distribution system, Role and Management of flow of material in supply chain management. Material Management Linkages: Linkages with other functional areas of Management i.e. Production, Accounting and Finance, Marketing, HRM, IT, TQM. A Brief discussion on the functions of each functional area of Management. Cost Involved in material management: Concept of costs and cost classification, specific costs associated with Material Management.

Storekeeping: Objectives and functions of storekeeping, location and layout of stores. Types of stores. Receipt of Materials: Receipt procedure, inspection and testing of materials, Rejection and Returns of materials. Forms used in receiving of materials like Material Received Note, Inspection

Report and Rejection Report etc. Passing of Bills/invoices for payment. Issue of Materials: Issue procedure and documents used, store records like bin card and store ledger, → pricing of material issues – different methods like FIFO, LIFO, Simple average, weighted average, standard price, Replacement / market price etc. Material losses: Meaning, accounting treatment and control of different type of material losses (waste, scrap, spoilage, defectives, obsolescence etc.). Store Handling Equipment: Advantages of using stores handling equipment, Types of handling equipment: manual and mechanical devices.

Purchase Procedure: Pre-purchase considerations, standard purchase procedure, post-purchase issues. Standard form used in purchasing like purchase requisition, tender / quotation documents, schedule of quotations, purchase order, follow-up order, cancellation of order, Bill of Materials etc. Special Purchase Systems – Forward Purchase, Tender purchase, Blanket order, zero stock, Rate contract etc. Price Forecasting: Price and Pricing impact, price negotiations and fixing. Purchasing under fluctuating prices, purchasing under uncertainty, Negotiations regarding quality, terms of contract, delivery, payment schedule, cash discount, quality considerations, etc. Public Buying: DGS&D Rate contract, GeM, GFR. Online Purchasing: Concept, advantages, procedure of online purchasing and current online purchase practices.

Buyer-seller Relationship: Importance of good buyer-seller relationship, Relation with supplier-policies and issues in relationship, Ethical issues in purchasing. Quality Control in Purchasing: Concept of Total Quality Management (TQM), Certification, Role of Material Management in TQM. Value Analysis and Value Engineering.

Business Correspondence: Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, Inter-office Memo, Notices, Agenda.

Inventories: Meaning, types of inventories, definition as per relevant accounting standard, Need and benefit of holding inventories, objectives of inventory management.

Financial Accounting: Nature and scope, Limitations of Financial Accounting. Basic Concepts and Conventions, Accounting Standards: Meaning, Significance, Generally Accepted Accounting Principles (GAAP). Accounting Process: From recording of transactions to preparation of final accounts. Rectification of errors and Bank Reconciliation statement. Depreciation Accounting: Meaning of depreciation, causes, objects of providing depreciation, factors affecting depreciation, accounting treatment including provision for depreciation accounting. Methods of depreciation: straight line method and diminishing balance method.

Work Study: Importance of work study – Method Study and Work Measurement Method Study: Method and Method Study – Need for Method Study – Procedure of Method Study – Principles of Motion Economy.

Work Measurement: Techniques of Work Measurement including Estimating, Stopwatch Time Study, Predetermined Time Standards, Synthetic Estimates of Work Times, Activity Sampling. Computation of Standard Time – Elements – Types of Elements – Performance Rating – Allowances – Need for Allowances – Types of Allowances TPM: Meaning and objectives of TPM; Methodology of TPM, gains of TPM.

Material Logistics: Concept and Importance of Material Logistics. Logistic Tasks: Follow-up of Order, Transportation, Warehousing, Inventory Control, Information Monitoring. Logistic Planning: Major Aspects and Factors. Transportation: A Brief Study of different modes of transport used for movement of materials, their relative advantages, disadvantages and suitability Warehousing: Concept of Warehousing (Warehouse, Depositor and Warehouseman), Elements and Functions of Warehousing. Types of Warehousing, Advantages of a Public Warehouse, Costs Associated with Warehousing, Quality Management Concepts: ISO Certification. Methods of Control: Product, Process, Risk, Evolution, Management Approaches, Quality Management Support System. R Chart, P Chart and

X charts; Acceptance Sampling & OC Curve in production Control. Supply Chain Management: Supply management an organization spanning activity. How purchasing becomes supply management? Supply Management and the Bottom line. The four phases of supply management. (Generation of requirement, sourcing, pricing and post award activities). Supply management systems: B2B, Strategic Supply Management. Enabling Concepts in Supply: Buyer-supplier relationship: Developing and Managing collaboration and Alliance relationship. Cross-functional teams and supply-Management Activities. Challenges and problems with cross functional approach, ERP Systems, Negotiations and Bidding, Information sharing.

The Indian Contract Act, 1872: Contract – meaning, characteristics and kinds, Essentials of valid contract Discharge of contract – modes of discharge including breach and its remedies, Contingent contracts, Quasi contracts The Indian Contract Act, 1872: Specific Contracts : Contract of Indemnity and Guarantee, Contract of Bailment, Contract of Agency The Sale of Goods Act, 1930: Contract of sale, meaning and difference between sale and agreement to sell, Conditions and warranties, Transfer of ownership in goods including sale by non-owners, Performance of contract of sale, Unpaid seller – meaning and rights of an unpaid seller against the goods and the buyer.

Partnership Law The Partnership Act, 1932: Nature and Characteristics of Partnership, Registration of Firms, Types of Partners, Rights and Duties of Partners, Implied Authority of a Partner, Incoming and outgoing Partners, Mode of Dissolution of Partnership.

The Limited Liability Partnership Act, 2008: Salient Features of LLP, Difference between LLP and Partnership, LLP and Company, LLP Agreement, Partners and Designated Partners, Incorporation Document, Incorporation by Registration, Partners and their Relations, winding up.

The Negotiable Instruments Act, 1881

Meaning and Characteristics of Negotiable Instruments: Promissory Note, bill of exchange, Cheque, Holder and Holder in due Course, Privileges of Holder in Due Course, Negotiation: Types of Endorsements, Crossing of Cheque, Bouncing of Cheques

Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management. Evaluation of Material Management Function: Meaning and Procedure. Evaluation Tools and Techniques.

Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management. Evaluation of Material Management Function: Meaning and Procedure. Evaluation Tools and Techniques.

F. Basic Knowledge of GeM (10 Marks)

G. Statistics (5 Marks):

- Collection of Data
- Measures of Central Tendency
- Measures of Dispersion
- Correlation & Regression
- Index Numbers
- Use of Statistical Tool
- Bar Graph, Line Charts, Pie-Charts, Venn Diagram
- Percentile Rank and Quartile Rank
- Data Interpretation
- Central Tendency, Dispersion, deviation, variance
- Skewness & Kurtosis

SYLLABUS FOR THE POST OF STOREKEEPER-CUM-CLERK

A. General Intelligence and Reasoning (30 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. the topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern folding & unfolding, Figural Pattern – folding and completion, indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thing, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (30 Marks):

50% Questions from General Awareness: Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations as may be expected of any educated person. The test will also include questions relating to India especially pertaining History, Culture, Geography, Economic Scene, General Policy.

C. Quantitative Aptitude (30 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ration & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work.

D. English Language (30 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Material Management (80 Marks):

Introduction to Materials Management: Objectives and Advantages of Materials Management
Supply Chain Management: Concept, objectives of supply – production and distribution system.
Material Management Linkages: Linkages with other functional areas of Management i.e. Production, Accounting and Finance, Marketing, HRM, IT, TQM. Storekeeping: Objectives and functions of storekeeping, Receipt of Materials: Receipt procedure, inspection and testing of materials, Rejection and Returns of materials. Issue of Materials: Issue procedure and documents used, store records like bin card and store ledger, → pricing of material issues – different methods like FIFO, LIFO, Simple average, weighted average, standard price, Replacement / market price etc. Material losses: Meaning, accounting treatment and control of different type of material losses (waste, scrap, spoilage, defectives, obsolescence etc.). Store Handling Equipment: Advantages of using stores handling equipment, Types of handling equipment: manual and mechanical devices.

Purchase Procedure: Pre-purchase considerations, standard purchase procedure, post-purchase issues. Special Purchase Systems – Forward Purchase, Tender purchase, Blanket order, zero stock,

Rate contract etc. Public Buying: GeM, GFR. Online Purchasing: Concept, advantages, procedure of online purchasing and current online purchase practices.

Business Correspondence: Letter Writing, presentation, Inviting quotations, Sending quotations, Placing orders, Inviting tenders, Sales letters, claim & adjustment letters and social correspondence, Memorandum, Inter -office Memo, Notices, Agenda, Minutes, Job application letter, preparing the Resume.

Logistic Planning: Major Aspects and Factors. Transportation: A Brief Study of different modes of transport used for movement of materials, their relative advantages, disadvantages and suitability. Road Transport: Consignment Note. Rail transport: Consignment Note. Air transport: Air Waybill, Contract of Affraightment. Warehousing: Concept of Warehousing (Warehouse, Depositor and Warehouseman), Elements and Functions of Warehousing, Types of Warehousing, Costs Associated with Warehousing, Quality Management Concepts: ISO Certification. Methods of Control: Product, Process, Risk, Evolution, Management Approaches, Quality Management Support System. R Chart, P Chart and X charts; Acceptance Sampling & OC Curve in production Control Enabling Concepts in Supply: ERP Systems, Negotiations and Bidding, Information sharing.

Computers in Material Management: Use of Computers in Material Planning, Purchase, Store, Issue and Inventory Control. Integrated Information System for Material Management.

SYLLABUS FOR THE POST OF TAILOR GRADE III

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons , Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

TRADE THEORY SUBJECTS –

Tools and equipment; Sewing machinery; Sewing techniques; Methods of finishing; Components; Fibers and fabrics; Buttonholes and fasteners; Trimming materials and accessories ; Patterns; Layouts; Color scheme; Quality criteria; Safety precautions; Anatomy of human figure

TRADE PRACTICAL SUBJECTS –

Identification and familiarization of trade tools; First aid; Measuring (body, materials and components); Making patterns (flat and block patterns); Cutting with hand-held tools; Arranging layouts; Pressing (using hand-held iron); Folding garments; Operating sewing machine (treadle, motorized and overlock); Maintaining sewing machine (treadle, motorized and overlock); Stitching by hand; Stitching by machine; Finishing; Fixing fasteners; Making buttonholes; Shaping garment; Stitching components; Finishing edges; Making corners and openings; Attaching collars and sleeves; Finishing neckline; Preparing waistline

SYLLABUS FOR THE POST OF TB & CHEST DISEASES HEALTH ASSISTANT

A. English Language (5 Marks) :

Questions in this component will be designed to test the candidate's understanding and knowledge of English language and will be based on spot the error, fill in the blanks, synonyms, antonyms, spelling/detecting mis-spelt words, idioms & phrases, one word substitution, improvement of sentences, active/passive voice of verbs, conversion into direct/indirect narration, shuffling of sentence parts, shuffling of sentences in a passage, comprehension passage and any other English language questions at the level of Matriculation/Higher Secondary.

B. Quantitative Ability (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be percentage, Ratio & Proportion, Square roots, Averages, Interest, Profit & Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & work, Basic algebraic identities of School Algebra, Elementary surds, Graphs of Linear Equations, Triangle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Square, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency Polygon, Bar diagram, Pie chart and any other question of Matriculation level.

C. Logical / Verbal Reasoning / Qualitative Aptitude (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualisation, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space Visualisation, Venn Diagrams, Drawing inferences, Punched hole/pattern - folding & un-folding, Figural Pattern folding and completion, Indexing, Address matching, Date & City matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence & Other subtopics, if any or any other questions as per the pattern of SSC/UPSC/SPSC, etc.

D. Subject Knowledge (80 Marks):

Objective type of multiple choice questions to assess the domain knowledge of the candidate in the relevant area specific to the job at the level of B.Sc (Hons.) Nursing/Diploma in Nursing academic syllabus along with nursing practice with specialisation in TB and Chest Diseases.

1. Nursing Art & Bio-Medical Waste.
2. Anatomy Physiology.
3. Microbiology & Hospital Infection Control
4. Medical Surgical Nursing & Intensive-care Nursing
5. Mental Health - Psychiatric

6. Midwifery & Gynaecology
7. Paediatric Nursing
8. Community Health Nursing Part I & Part II – Hygiene

SYLLABUS FOR THE POST OF TECHNICAL ASSISTANT / TECHNICIAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

Biochemistry –

- Cleaning and care of general laboratory glass ware and equipment. Types of pipettes, calibration of pipettes.

- Distilled water. Method of preparation and storage of distilled water. Type of water distillation plants.
- Preparation of solutions – units of weights and volume, Calculation of concentration and methods of expressing concentration of solution.
- Units of Measurement - S.I unit and CGS units. Normality, Molarity, Molality
- Calibration of volumetric apparatus
- Principle, working and maintenance of Analytical balance
- Quality control and quality assurance in a clinical biochemistry laboratory
- Laboratory organization, management and maintenance of records
- Principles of assay procedures, Normal range in blood, Serum, Plasma and Urine and reference values.
- pH – Definition, Henderson Hasselbach equation, Pka value, pH indicator, Methods of measurement of pH, pH paper, pH meter, Principle, working, maintenance and calibration of pH meter
- Volumetric analysis- Normal and molar solutions, Standard solutions, Preparation of reagents, Storage of chemicals
- Working principles Types and applications of Electrophoresis – Paper, Agarose Gel, Cellulose Acetate and PAGE.
- Working principles, types and applications of Chromatography - Paper Chromatography, TLC, Ion Exchange, Affinity Gel, Filtration, Gas Chromatography and HPLC.
- Working principles, types and application of centrifugation
- Working Principles and application of photometry, and atomic absorption, Spectrophotometry and colorimetry.
- Definition, basic concepts of classification mechanism of action and properties of enzymes, factors influencing enzyme action
- Basic and elementary concepts of chemistry and properties of carbohydrates as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of carbohydrates – Methods for determining glucose, ketones, lactate, pyruvate reducing sugars and mucopolysaccharides and their clinical significance. Biochemistry, types, criteria parameters in diagnosis and prognosis of Diabetes mellitus.
- Basic and elementary concepts of chemistry and properties of lipids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of lipid. Importance of lipids in the body in body basic metabolic aspects and analytical importance. Disorders of lipid metabolism. Lipoproteins patterns in disease – analytical methods and procedures applicable to detecting and monitoring such disorders.
- Basic and elementary concepts of chemistry and properties of proteins & amino acids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of amino acids and proteins – current methodologies for their determination and identification in biological specimens – disease associated with alternation in or deficiencies of amino acids and proteins.
- Basic and elementary concepts of chemistry and properties of nucleic Acids as applicable to the human body.
- Basic concepts of principles of nutrition and nutrients macro and micro nutrients. Vitamins & Minerals. Vitamins- Fat soluble vitamins , Water soluble vitamins sources, Biochemical role, RDA, deficiency manifestations Minerals – Calcium, Phosphorous, Iron, Copper, Zinc, Magnesium, Manganese, Iodine.
- Analytical methods and recommendations for testing and assessing nutritional deficiency – Methods for assessing concentration of vitamins in biological samples.

- General requirements for laboratory assessment of trace elements including specimen collection, handling, selection of analytical methodology and establishing quality.
- Overview of Biochemical roles of major electrolytes and blood gases and their changes in pathological states – relationship between major electrolytes and acid base balance – application of physical and chemical principles to biological system – laboratory measurements of electrolytes and blood gases. Acid base balance disorders
- Overview of current concepts in endocrinology RIA, ELISA, chemiluminescence assay procedure for hormones – physiological effects produced by normal and abnormal levels of various hormones. Thyroid function test and Adrenal function test.
- Introduction to molecular Biology. Recombinant DNA technology, Role of recombinant DNA technology as diagnostic tool. Polymerase chain reaction.
- Overview of porphyrins, their precursors, primary and secondary disorders of porphyrin metabolism – diagnostic laboratory methodologies including appropriate specimen collection and preservation techniques related to porphyrins
- Laboratory tests and analytical methods used in identification and evaluation of hepatobiliary disorders, renal disorders and disorders of Stomach, pancreas and intestinal tract
- Overview of calcium and inorganic phosphate metabolism current laboratory analytical

Microbiology –

- History of Medical Microbiology - Host-Microbe relationship.
- Safety Measures in clinical microbiology
- Cleaning, care and handling of glassware
- Care and maintenance of Equipment in Microbiology.
- Microscopy: Principle, types and uses of microscope
- Sterilization and Disinfection - Definition, Types, principles, mode of action and methods. Qualities of a good disinfectant. Assay for various disinfectants .
- Biomedical waste management in a lab
- General characteristics & classification of Microbes : Classification of microbes. Morphological classification of bacteria, Bacterial anatomy (Bacterial cell structures)
- Growth and nutrition of bacteria, Culture media and culture methods-aerobic and anaerobic
- Quality control and safety in microbiology.
- Handling and care of laboratory animals.
- Antimicrobial agents, Antimicrobial susceptibility tests.
- Stains used in bacteriology Principle, procedures, significance and interpretation - Simple staining, Gram stain, Ziehl –Neelsen staining, Albert's stain, Capsule staining.
- Principle, procedures and interpretation of the biochemical tests for identification of different bacteria.
- Immunity – innate and acquired immunity, humoral and cell mediated.
- Antigen antibody reactions and their applications
- Complement
- Hypersensitivity
- Vaccines
- Gram positive & Gram negative cocci – Staphylococci, Streptococci, Enterococci, Pneumococci, Neisseria
- Gram positive bacilli – Corynebacterium, Mycobacterium, Actinomyces, Listeria, Bacillus, Clostridia
- Gram negative bacilli – Enterobacteriaceae, Pseudomonas, Vibrio, Aeromonas, Plesiomonas, Campylobacter, Bacteroides, Fusobacterium, Brucella, Haemophilus,

Bordetella, Pasteurella, Francisella

- Spirochaetes, Chlamydia, Rickettsia, Mycoplasma, L forms
- General properties of viruses – Structure, classification and replication.
- Laboratory diagnosis of virus
- DNA virus –Adenovirus, Papova virus, Herpes virus, Varicella zoster virus, Cytomegalo virus, Hepatitis B virus
- RNA virus – Polio virus, Influenza virus, Para influenza virus, Mumps virus, Measles virus, Rubella virus, Respiratory syncytial virus, Rhinovirus, Rotavirus, Hepatitis virus, Arbo viruses prevalent in India (Dengue, West Nile, Japanese Encephalitis, KFD), HIV, Rabies virus, SARS virus.
- Bacteriophage
- Introduction to Parasitology –Common definitions, Types and Classification of parasites.
- Collection transport and preservation of specimens for parasitological examination
- Protozoa: Entamoeba Trichomonas, Trypanosomes, Leishmania, Giardia, Plasmodium, Isospora, Balantidium, and Toxoplasma.
- Cestodes - Diphylobothrium, Taenia, Echinococcus, Hymenolepis.
- Trematodes - Schistosoma, Fasciola, Fasciolopsis, Clonorchis, Paragonimus
- Intestinal Nematodes - Ascaris, Ancylostoma, Necator, Strongyloides, Trichinella Enterobius, Trichuris
- Tissue Nematodes - Wuchereia, Brugia, Loa loa, Onchocerca, Dracunculus
- Collection and preservation of specimens for parasitological examination, preservation of specimens of parasitic eggs and embryos, Preserving Fluids, Transport of specimens.
- Morphology and classification of fungus
- Laboratory diagnosis of fungus- Culture media used in mycology, Direct microscopy in Medical mycology laboratory, Processing of clinical samples for diagnosis of fungal infections i.e. Skin, nail, hair, pus, sputum, CSF and other body fluids.
- Superficial fungal infections
- Subcutaneous fungal infections
- Deep fungal infections
- Opportunistic fungal infections
- Techniques used for isolation and identification of medically important fungi
- Methods for identification of yeasts and moulds
- Preservation of fungal cultures

Pathology –

- General-Haematology: Origin, development, morphology, maturation, function and fate of blood cells, nomenclature of blood cells.
- Various methods of blood collection, anticoagulants-mechanism and uses.
- Basic concepts of automation in haematology
- Counting chamber- hemocytometry. Enumeration of RBC including various counting chambers, diluting fluids for RBC count.
- Haemoglobinometry. Principles and methods of quantitating Hb. Concentration of blood including knowledge of errors and quality control in various method. Abnormal hemoglobin and its investigation.
- ESR: introduction, factors affecting ESR, principles and methods of determining ESR, increasing and decreasing conditions of ESR.
- WBC: introduction, development of WBC, diluting fluids. Absolute eosinophil count, errors in sampling, mixing, diluting and counting.

- Cell counting, advantages and disadvantages, uses and mechanism of cell counting, quality control in cell counts.
- Preparation of peripheral smear and bone marrow smear. Thin smear, thick smear. Buffy coat smear, wet preparation. Romanowsky stain. Preparation advantages and disadvantages.
- Principle and methods of staining of Blood smears and bone marrow smears. Supravital stain. Reticulocyte count. Heinz bodies.
- Description of morphology of normal and abnormal red cells. Blood differential WBC counting. Recognition of abnormal cell. Anaemia – definition etiology classification and laboratory diagnosis.
- Methods of identification and estimation of abnormal hemoglobin including spectroscopy. HB electrophoresis. Alkali denaturation Test. Sickle cell preparation.
- Various benign leucocyte reaction – Leukocytosis. Neutrophilia, Eosinophilia, Lymphocytosis. Infectious mononucleosis. leucopenias.
- Leukemias – definition, causes, classification, detection of leukemia. Total leucocyte count in leukemias. Multiple myeloma.
- Blood Coagulation and disorders of hemostasis. Classification of coagulation factors, Principles and methods of assessment of coagulation. BT, CT, Prothrombin time, partial thromboplastin time, thromboplastin regeneration time
- Thrombocytopenia, thrombocythemias, platelet function test, platelet count. Clot retraction test. Platelet factor III Test.
- LE cell – definition, morphology causative agents. Various methods of demonstrating LE cells. Blood parasites. Malaria, LD bodies, microfilaria and methods of demonstration.
- Preparation of donor and collection of blood. Solution and apparatus used. Storage of blood. Preparation and storage of plasma. Preparation of packed red cells.
- Principles involved in Blood grouping. ABO system and the methods used. Factors influencing the results of blood grouping, Rh system. Rh antigen. Principles and methods used.
- Cross matching. Compatibility test, direct and indirect Coomb's test – Principle involved and the methods used. Blood transfusion and its Hazards.
- Definition, sources and types histological specimens, kinds of histological presentations
- Labelling, fixation, properties of fixing fluids, classification and composition of fixing fluids. Advantages and disadvantages of secondary fixatives. Post chroming.
- Tissue processing, dehydration and cleaning.
- Embedding. Water soluble substances, embedding in paraffin nitrocellulose
- Equipment for sectioning microtome, knife, honing and stropping. Types, care and use of microtome.
- Technique for sectioning – frozen section. Technique for sectioning – Paraffin embedded tissue. Errors in sectioning and remedies. Attaching blocks to carriers.
- Technique of processing bone for histological studies. Mounting and covering. Mounting media.
- Staining – theory, types of staining agent. Mordents and differentiation. H & E staining. Types of hematoxylin and its preparation. Eosin stock stain and other counter stain used.
- Demonstration of collagen, reticulin, elastin, fat, amyloid, glycogen, mucin, pigments and minerals (malarial, mercury, bile, lipofuscin, calcium, iron, copper).
- Principles of histochemistry and its application
- Demonstration of neuron, neuroglia, myelin and axon. Processing of eye ball for histology.
- Demonstration of fat, iron, amyloid, bile in large sections of tissue.
- Cytology – introduction, definition, types of cytological specimen, preparation of slide for microscopic studies, stains used.

- Museum technique. Preparation, setting up of and arrangement of museum.
- Preparation of cell blocks, mailing of slides.
- FNAC, definition, techniques involved in preparation of smear and staining. PAP smear.
- Calibration and Validation of Clinical Laboratory instruments

SYLLABUS FOR THE POST OF TECHNICAL ASSISTANT/TECHNICIAN

A. General Intelligence & Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

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D. English Language (5 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (80 Marks):

Biochemistry –

- Cleaning and care of general laboratory glass ware and equipment. Types of pipettes, calibration of pipettes.

- Distilled water. Method of preparation and storage of distilled water. Type of water distillation plants.
- Preparation of solutions – units of weights and volume, Calculation of concentration and methods of expressing concentration of solution.
- Units of Measurement - S.I unit and CGS units. Normality, Molarity, Molality
- Calibration of volumetric apparatus
- Principle, working and maintenance of Analytical balance
- Quality control and quality assurance in a clinical biochemistry laboratory
- Laboratory organization, management and maintenance of records
- Principles of assay procedures, Normal range in blood, Serum, Plasma and Urine and reference values.
- pH – Definition, Henderson Hasselbach equation, Pka value, pH indicator, Methods of measurement of pH, pH paper, pH meter, Principle, working, maintenance and calibration of pH meter
- Volumetric analysis- Normal and molar solutions, Standard solutions, Preparation of reagents, Storage of chemicals
- Working principles Types and applications of Electrophoresis – Paper, Agarose Gel, Cellulose Acetate and PAGE.
- Working principles, types and applications of Chromatography - Paper Chromatography, TLC, Ion Exchange, Affinity Gel, Filtration, Gas Chromatography and HPLC.
- Working principles, types and application of centrifugation
- Working Principles and application of photometry, and atomic absorption, Spectrophotometry and colorimetry.
- Definition, basic concepts of classification mechanism of action and properties of enzymes, factors influencing enzyme action
- Basic and elementary concepts of chemistry and properties of carbohydrates as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of carbohydrates – Methods for determining glucose, ketones, lactate, pyruvate reducing sugars and mucopolysaccharides and their clinical significance. Biochemistry, types, criteria parameters in diagnosis and prognosis of Diabetes mellitus.
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- Overview of metabolism of amino acids and proteins – current methodologies for their determination and identification in biological specimens – disease associated with alternation in or deficiencies of amino acids and proteins.
- Basic and elementary concepts of chemistry and properties of nucleic Acids as applicable to the human body.
- Basic concepts of principles of nutrition and nutrients macro and micro nutrients. Vitamins & Minerals. Vitamins- Fat soluble vitamins , Water soluble vitamins sources, Biochemical role, RDA, deficiency manifestations Minerals – Calcium, Phosphorous, Iron, Copper, Zinc, Magnesium, Manganese, Iodine.
- Analytical methods and recommendations for testing and assessing nutritional deficiency – Methods for assessing concentration of vitamins in biological samples.

- General requirements for laboratory assessment of trace elements including specimen collection, handling, selection of analytical methodology and establishing quality.
- Overview of Biochemical roles of major electrolytes and blood gases and their changes in pathological states – relationship between major electrolytes and acid base balance – application of physical and chemical principles to biological system – laboratory measurements of electrolytes and blood gases. Acid base balance disorders
- Overview of current concepts in endocrinology RIA, ELISA, chemiluminescence assay procedure for hormones – physiological effects produced by normal and abnormal levels of various hormones. Thyroid function test and Adrenal function test.
- Introduction to molecular Biology. Recombinant DNA technology, Role of recombinant DNA technology as diagnostic tool. Polymerase chain reaction.
- Overview of porphyrins, their precursors, primary and secondary disorders of porphyrin metabolism – diagnostic laboratory methodologies including appropriate specimen collection and preservation techniques related to porphyrins
- Laboratory tests and analytical methods used in identification and evaluation of hepatobiliary disorders, renal disorders and disorders of Stomach, pancreas and intestinal tract
- Overview of calcium and inorganic phosphate metabolism current laboratory analytical

Microbiology –

- History of Medical Microbiology - Host-Microbe relationship.
- Safety Measures in clinical microbiology
- Cleaning, care and handling of glassware
- Care and maintenance of Equipment in Microbiology.
- Microscopy: Principle, types and uses of microscope
- Sterilization and Disinfection - Definition, Types, principles, mode of action and methods. Qualities of a good disinfectant. Assay for various disinfectants .
- Biomedical waste management in a lab
- General characteristics & classification of Microbes : Classification of microbes. Morphological classification of bacteria, Bacterial anatomy (Bacterial cell structures)
- Growth and nutrition of bacteria, Culture media and culture methods-aerobic and anaerobic
- Quality control and safety in microbiology.
- Handling and care of laboratory animals.
- Antimicrobial agents, Antimicrobial susceptibility tests.
- Stains used in bacteriology Principle, procedures, significance and interpretation - Simple staining, Gram stain, Ziehl –Neelsen staining, Albert's stain, Capsule staining.
- Principle, procedures and interpretation of the biochemical tests for identification of different bacteria.
- Immunity – innate and acquired immunity, humoral and cell mediated.
- Antigen antibody reactions and their applications
- Complement
- Hypersensitivity
- Vaccines
- Gram positive & Gram negative cocci – Staphylococci, Streptococci, Enterococci, Pneumococci, Neisseria
- Gram positive bacilli – Corynebacterium, Mycobacterium, Actinomyces, Listeria, Bacillus, Clostridia
- Gram negative bacilli – Enterobacteriaceae, Pseudomonas, Vibrio, Aeromonas, Plesiomonas, Campylobacter, Bacteroides, Fusobacterium, Brucella, Haemophilus, Bordetella. Pasteurella, Francisella

- Spirochaetes, Chlamydia, Rickettsia, Mycoplasma, L forms
- General properties of viruses – Structure, classification and replication.
- Laboratory diagnosis of virus
- DNA virus –Adenovirus, Papova virus, Herpes virus, Varicella zoster virus, Cytomegalo virus, Hepatitis B virus
- RNA virus – Polio virus, Influenza virus, Para influenza virus, Mumps virus, Measles virus, Rubella virus, Respiratory syncytial virus, Rhinovirus, Rotavirus, Hepatitis virus, Arbo viruses prevalent in India (Dengue, West Nile, Japanese Encephalitis, KFD), HIV, Rabies virus, SARS virus.
- Bacteriophage
- Introduction to Parasitology –Common definitions, Types and Classification of parasites.
- Collection transport and preservation of specimens for parasitological examination
- Protozoa: Entamoeba Trichomonas, Trypanosomes, Leishmania, Giardia, Plasmodium, Isospora, Balantidium, and Toxoplasma.
- Cestodes - Diphylobothrium, Taenia, Echinococcus, Hymenolepis.
- Trematodes - Schistosoma, Fasciola, Fasciolopsis, Clonorchis, Paragonimus
- Intestinal Nematodes - Ascaris, Ancylostoma, Necator, Strongyloides, Trichinella Enterobius, Trichuris
- Tissue Nematodes - Wucherei, Brugia, Loa loa, Onchocerca, Dracunculus
- Collection and preservation of specimens for parasitological examination, preservation of specimens of parasitic eggs and embryos, Preserving Fluids, Transport of specimens.
- Morphology and classification of fungus
- Laboratory diagnosis of fungus- Culture media used in mycology, Direct microscopy in Medical mycology laboratory, Processing of clinical samples for diagnosis of fungal infections i.e. Skin, nail, hair, pus, sputum, CSF and other body fluids.
- Superficial fungal infections
- Subcutaneous fungal infections
- Deep fungal infections
- Opportunistic fungal infections
- Techniques used for isolation and identification of medically important fungi
- Methods for identification of yeasts and moulds
- Preservation of fungal cultures

Pathology –

- General-Haematology: Origin, development, morphology, maturation, function and fate of blood cells, nomenclature of blood cells.
- Various methods of blood collection, anticoagulants-mechanism and uses.
- Basic concepts of automation in haematology
- Counting chamber- hemocytometry. Enumeration of RBC including various counting chambers, diluting fluids for RBC count.
- Haemoglobinometry. Principles and methods of quantitating Hb. Concentration of blood including knowledge of errors and quality control in various method. Abnormal hemoglobin and its investigation.
- ESR: introduction, factors affecting ESR, principles and methods of determining ESR, increasing and decreasing conditions of ESR.
- WBC: introduction, development of WBC, diluting fluids. Absolute eosinophil count, errors in sampling, mixing, diluting and counting.
- Cell counting, advantages and disadvantages, uses and mechanism of cell counting, quality control in cell counts.
- Preparation of peripheral smear and bone marrow smear. Thin smear, thick smear. Buffy coat smear, wet preparation. Romanowsky stain. Preparation advantages and disadvantages.

- Principle and methods of staining of Blood smears and bone marrow smears. Supravital stain. Reticulocyte count. Heinz bodies.
- Description of morphology of normal and abnormal red cells. Blood differential WBC counting. Recognition of abnormal cell. Anaemia – definition etiology classification and laboratory diagnosis.
- Methods of identification and estimation of abnormal hemoglobin including spectroscopy. HB electrophoresis. Alkali denaturation Test. Sickle cell preparation.
- Various benign leucocyte reaction – Leukocytosis. Neutrophilia, Eosinophilia, Lymphocytosis. Infectious mononucleosis. leucopenias.
- Leukemias – definition, causes, classification, detection of leukemia. Total leucocyte count in leukemias. Multiple myeloma.
- Blood Coagulation and disorders of hemostasis. Classification of coagulation factors, Principles and methods of assessment of coagulation. BT, CT, Prothrombin time, partial thromboplastin time, thromboplastin regeneration time
- Thrombocytopenia, thrombocythemia, platelet function test, platelet count. Clot retraction test. Platelet factor III Test.
- LE cell – definition, morphology causative agents. Various methods of demonstrating LE cells. Blood parasites. Malaria, LD bodies, microfilaria and methods of demonstration.
- Preparation of donor and collection of blood. Solution and apparatus used. Storage of blood. Preparation and storage of plasma. Preparation of packed red cells.
- Principles involved in Blood grouping. ABO system and the methods used. Factors influencing the results of blood grouping, Rh system. Rh antigen. Principles and methods used.
- Cross matching. Compatibility test, direct and indirect Coomb's test – Principle involved and the methods used. Blood transfusion and its Hazards.
- Definition, sources and types histological specimens, kinds of histological presentations
- Labelling, fixation, properties of fixing fluids, classification and composition of fixing fluids. Advantages and disadvantages of secondary fixatives. Post chroming.
- Tissue processing, dehydration and cleaning.
- Embedding. Water soluble substances, embedding in paraffin nitrocellulose
- Equipment for sectioning microtome, knife, honing and stropping. Types, care and use of microtome.
- Technique for sectioning – frozen section. Technique for sectioning – Paraffin embedded tissue. Errors in sectioning and remedies. Attaching blocks to carriers.
- Technique of processing bone for histological studies. Mounting and covering. Mounting media.
- Staining – theory, types of staining agent. Mordents and differentiation. H & E staining. Types of hematoxylin and its preparation. Eosin stock stain and other counter stain used.
- Demonstration of collagen, reticulin, elastin, fat, amyloid, glycogen, mucin, pigments and minerals (malarial, mercury, bile, lipofuscin, calcium, iron, copper).
- Principles of histochemistry and its application
- Demonstration of neuron, neuroglia, myelin and axon. Processing of eye ball for histology.
- Demonstration of fat, iron, amyloid, bile in large sections of tissue.
- Cytology – introduction, definition, types of cytological specimen, preparation of slide for microscopic studies, stains used.
- Museum technique. Preparation, setting up of and arrangement of museum.
- Preparation of cell blocks, mailing of slides.
- FNAC, definition, techniques involved in preparation of smear and staining. PAP smear.
- Calibration and Validation of Clinical Laboratory instruments

SYLLABUS FOR THE POST OF TECHNICAL OFFICER (TECHNICAL SUPERVISOR)

A. General Intelligence & Reasoning (5 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (5 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (5 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (80 Marks):

Biochemistry –

- Cleaning and care of general laboratory glass ware and equipment. Types of pipettes, calibration of pipettes.
- Distilled water. Method of preparation and storage of distilled water. Type of water distillation plants.

- Preparation of solutions – units of weights and volume, Calculation of concentration and methods of expressing concentration of solution.
- Units of Measurement - S.I unit and CGS units. Normality, Molarity, Molality
- Calibration of volumetric apparatus
- Principle, working and maintenance of Analytical balance
- Quality control and quality assurance in a clinical biochemistry laboratory
- Laboratory organization, management and maintenance of records
- Principles of assay procedures, Normal range in blood, Serum, Plasma and Urine and reference values.
- pH – Definition, Henderson Hasselbach equation, Pka value, pH indicator, Methods of measurement of pH, pH paper, pH meter, Principle, working, maintenance and calibration of pH meter
- Volumetric analysis- Normal and molar solutions, Standard solutions, Preparation of reagents, Storage of chemicals
- Working principles Types and applications of Electrophoresis – Paper, Agarose Gel, Cellulose Acetate and PAGE.
- Working principles, types and applications of Chromatography - Paper Chromatography, TLC, Ion Exchange, Affinity Gel, Filtration, Gas Chromatography and HPLC.
- Working principles, types and application of centrifugation
- Working Principles and application of photometry, and atomic absorption, Spectrophotometry and colorimetry.
- Definition, basic concepts of classification mechanism of action and properties of enzymes, factors influencing enzyme action
- Basic and elementary concepts of chemistry and properties of carbohydrates as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of carbohydrates – Methods for determining glucose, ketones, lactate, pyruvate reducing sugars and mucopolysaccharides and their clinical significance. Biochemistry, types, criteria parameters in diagnosis and prognosis of Diabetes mellitus.
- Basic and elementary concepts of chemistry and properties of lipids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of lipid. Importance of lipids in the body in body basic metabolic aspects and analytical importance. Disorders of lipid metabolism. Lipoproteins patterns in disease – analytical methods and procedures applicable to detecting and monitoring such disorders.
- Basic and elementary concepts of chemistry and properties of proteins & amino acids as applicable to the human body. (Classification, Digestion and Absorption, Metabolism, Disorders of metabolism)
- Overview of metabolism of amino acids and proteins – current methodologies for their determination and identification in biological specimens – disease associated with alteration in or deficiencies of amino acids and proteins.
- Basic and elementary concepts of chemistry and properties of nucleic Acids as applicable to the human body.
- Basic concepts of principles of nutrition and nutrients macro and micro nutrients. Vitamins & Minerals. Vitamins- Fat soluble vitamins , Water soluble vitamins sources, Biochemical role, RDA, deficiency manifestations Minerals – Calcium, Phosphorous, Iron, Copper, Zinc, Magnesium, Manganese, Iodine.
- Analytical methods and recommendations for testing and assessing nutritional deficiency – Methods for assessing concentration of vitamins in biological samples.
- General requirements for laboratory assessment of trace elements including specimen collection, handling, selection of analytical methodology and establishing quality.

- Overview of Biochemical roles of major electrolytes and blood gases and their changes in pathological states – relationship between major electrolytes and acid base balance – application of physical and chemical principles to biological system – laboratory measurements of electrolytes and blood gases. Acid base balance disorders
- Overview of current concepts in endocrinology RIA, ELISA, chemiluminescence assay procedure for hormones – physiological effects produced by normal and abnormal levels of various hormones. Thyroid function test and Adrenal function test.
- Introduction to molecular Biology. Recombinant DNA technology, Role of recombinant DNA technology as diagnostic tool. Polymerase chain reaction.
- Overview of porphyrins, their precursors, primary and secondary disorders of porphyrin metabolism – diagnostic laboratory methodologies including appropriate specimen collection and preservation techniques related to porphyrins
- Laboratory tests and analytical methods used in identification and evaluation of hepatobiliary disorders, renal disorders and disorders of Stomach, pancreas and intestinal tract
- Overview of calcium and inorganic phosphate metabolism current laboratory analytical

Microbiology –

- History of Medical Microbiology - Host-Microbe relationship.
- Safety Measures in clinical microbiology
- Cleaning, care and handling of glassware
- Care and maintenance of Equipment in Microbiology.
- Microscopy: Principle, types and uses of microscope
- Sterilization and Disinfection - Definition, Types, principles, mode of action and methods. Qualities of a good disinfectant. Assay for various disinfectants .
- Biomedical waste management in a lab
- General characteristics & classification of Microbes : Classification of microbes. Morphological classification of bacteria, Bacterial anatomy (Bacterial cell structures)
- Growth and nutrition of bacteria, Culture media and culture methods-aerobic and anaerobic
- Quality control and safety in microbiology.
- Handling and care of laboratory animals.
- Antimicrobial agents, Antimicrobial susceptibility tests.
- Stains used in bacteriology Principle, procedures, significance and interpretation - Simple staining, Gram stain, Ziehl –Neelsen staining, Albert’s stain, Capsule staining.
- Principle, procedures and interpretation of the biochemical tests for identification of different bacteria.
- Immunity – innate and acquired immunity, humoral and cell mediated.
- Antigen antibody reactions and their applications
- Complement
- Hypersensitivity
- Vaccines
- Gram positive & Gram negative cocci – Staphylococci, Streptococci, Enterococci, Pneumococci, Neisseria
- Gram positive bacilli – Corynebacterium, Mycobacterium, Actinomyces, Listeria, Bacillus, Clostridia
- Gram negative bacilli – Enterobacteriaceae, Pseudomonas, Vibrio, Aeromonas, Plesiomonas, Campylobacter, Bacteroides, Fusobacterium, Brucella, Haemophilus, Bordetella. Pasteurella, Francisella
- Spirochaetes, Chlamydia, Rickettsia, Mycoplasma, L forms
- General properties of viruses – Structure, classification and replication.

- Laboratory diagnosis of virus
- DNA virus –Adenovirus, Papova virus, Herpes virus, Varicella zoster virus, Cytomegalo virus, Hepatitis B virus
- RNA virus – Polio virus, Influenza virus, Para influenza virus, Mumps virus, Measles virus, Rubella virus, Respiratory syncytial virus, Rhinovirus, Rotavirus, Hepatitis virus, Arbo viruses prevalent in India (Dengue, West Nile, Japanese Encephalitis, KFD), HIV, Rabies virus, SARS virus.
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- Haemoglobinometry. Principles and methods of quantitating Hb. Concentration of blood including knowledge of errors and quality control in various method. Abnormal hemoglobin and its investigation.
- ESR: introduction, factors affecting ESR, principles and methods of determining ESR, increasing and decreasing conditions of ESR.
- WBC: introduction, development of WBC, diluting fluids. Absolute eosinophil count, errors in sampling, mixing, diluting and counting.
- Cell counting, advantages and disadvantages, uses and mechanism of cell counting, quality control in cell counts.
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- Cross matching. Compatibility test, direct and indirect Coomb's test – Principle involved and the methods used. Blood transfusion and its Hazards.
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- Labelling, fixation, properties of fixing fluids, classification and composition of fixing fluids. Advantages and disadvantages of secondary fixatives. Post chroming.
- Tissue processing, dehydration and cleaning.
- Embedding. Water soluble substances, embedding in paraffin nitrocellulose
- Equipment for sectioning microtome, knife, honing and stropping. Types, care and use of microtome.
- Technique for sectioning – frozen section. Technique for sectioning – Paraffin embedded tissue. Errors in sectioning and remedies. Attaching blocks to carriers.
- Technique of processing bone for histological studies. Mounting and covering. Mounting media.
- Staining – theory, types of staining agent. Mordents and differentiation. H & E staining. Types of hematoxillin and its preparation. Eosin stock stain and other counter stain used.
- Demonstration of collagen, reticulin, elastin, fat, amyloid, glycogen, mucin, pigments and minerals (malarial, mercury, bile, lipofuscin, calcium, iron, copper).
- Principles of histochemistry and its application
- Demonstration of neuron, neuroglia, myelin and axon. Processing of eye ball for histology.
- Demonstration of fat, iron, amyloid, bile in large sections of tissue.
- Cytology – introduction, definition, types of cytological specimen, preparation of slide for microscopic studies, stains used.
- Museum technique. Preparation, setting up of and arrangement of museum.
- Preparation of cell blocks, mailing of slides.
- FNAC, definition, techniques involved in preparation of smear and staining. PAP smear.
- Calibration and Validation of Clinical Laboratory instruments

SYLLABUS FOR THE POST OF TECHNICAL OFFICER OPHTHALMOLOGY (REFRACTIONIST)

Subject Knowledge (100 Marks):

ANATOMY AND PHYSIOLOGY

- **Basic Human Anatomy:** 1. Cell and various tissues of the body. 2. Skeletal system of human body. 3. Muscular system. 4. Embryology and development (including Embryology of the eye).
- **Basic Human Physiology:** 1. Cardio-vascular system. 2. Digestive system. 3. Respiratory system. 4. Endocrine organs. 5. Excretory system. 6. Reproductive system. 7. Central nervous system. 8. Peripheral nervous system. 9. Autonomic nervous system. 10. Organs of taste, smell and hearing.
- **Ocular Anatomy:** 1. Orbit & its immediate relations. 2. Lids & their glands. 3. Conjunctiva, Cornea, Sclera and Limbus. 4. Iris & Ciliary body. 5. Lens and Vitreous. 6. Retina & Choroid. 7. Ocular muscles. 8. Visual pathways. 9. Lacrimal apparatus. 10. Higher visual centres.
- **Ocular Physiology:** 1. An introduction to general physiology of the eye. 2. Maintenance of transparency of the cornea. 3. Maintenance of transparency of the lens. 4. Visual acuity & form sense. 5. Pupillary reflexes. 6. Accommodation. 7. Convergence. 8. Intra-ocular pressure. 9. Night vision. 10. Colour vision. 11. Visual fields. 12. Extrinsic muscles, actions and ocular movements. 13. Higher visual centres and righting reflexes. 14. Electro-physiological aspects (ERG, EOG & VER). 15. Functions of lacrimal apparatus and tears.

OCULAR PATHOLOGY, MICROBIOLOGY AND BIOCHEMISTRY

- **Ocular Pathology:** 1. Blood sample collection and preservation. 2. Routine Haematological examinations: Hb, BT, CT, TLC, DLC and ESR. 3. Peripheral Blood Film (PBF)- staining & its significance. 4. Urine sample collection methods. 5. Urine: Physical, Chemical & Microscopic examination. 6. Grossing of tissue. 7. Tissue processing. 8. Fixation of tissue. 9. Section cutting. 10. Staining: Haematoxylin, Eosin & Special stains.
- **Ocular Microbiology:** 1. Introduction to Microbiology & classification. 2. Normal flora of eye. 3. Sterilization /Aseptic techniques. 4. Culture media for Bacteria, fungi & Virus. 5. Bacteria: Gram positive & negative. 6. Fungi: Saprophytic and Pathogenic. 7. Virus. 8. Chlamydia & parasites. 9. Microbial diseases of the eye. 10. Staining procedures: Gram & KOH.
- **Ocular Bio-chemistry:** 1. Introduction to basic Biochemistry (carbohydrates, lipids, proteins and vitamins). 2. Tear film. 3. Metabolism of cornea and lens. 4. Aqueous & Vitreous. 5. Rhodopsin cycle.

BASIC ORTHOPTICS

- **Basic Orthoptics:** 1. General introduction. 2. Binocular vision & Space perception (Fusion, Diplopia, Correspondence, Stereopsis, Panum's area, Fixation disparity, Horopter, BSV, Retinal rivalry, Physiological diplopia, Stereopsis & monocular clues, Egocentric localization, Theories of Binocular vision). 3. Extra-ocular muscles Anatomy and Physiology. 4. Laws of ocular motility. 5. Uni-ocular & Binocular movements (Version & Vergence, Fixation & field of fixation). 6. Near vision complex (Accommodation, Convergence & Pupillary constriction). 7. Confusion & Diplopia. 8. Suppression. 9. Stereopsis. 10. Asthenopia & Diplopia. 11. Visual acuity assessment in children. 12. Cover, cover-uncover & alternate cover tests. 13. Heterophoria: Classification, examination & management. 14. Orthoptic instruments: Near point ruler, Prism-Bar, Maddox-rod, Maddox-wing, Synoptophore.

OPTICS & REFRACTION

- **Physical & Visual Optics:** 1. Elementary basis of light (Interference, Diffraction, Scattering, Dispersion, Polarization & Spectrum). 2. Illumination & Photometry. 3. Laws of reflection. 4. Principles of refraction. • Refraction by Glass plate with parallel sides. • Refraction by Prisms (including nomenclature of prisms). • Refraction at Curved surfaces (Convex, Concave, Cylindrical & Sphero-cylindrical/Sturm's conoid). • Refraction by Optical systems (Combination of lenses, Compound homocentric system & Thick lenses). 5. Power specification (Refractive, Approximate, Back Vertex, Front Vertex, Equivalent & Effective Power). 6. Power

measurement (Hand neutralization, lensometry & Lens surface power measurement/ Geneva lens measure). 7. Optical system of eye (Corneal & Lenticular system). 8. Catoptric images (Principle and utility of Purkinje's image in keratometry and pachymetry). 9. Schematic & Reduced eye. 10. Physiological optical defects of eye. 11. Correction of Ammetropia: Myopia, Hypermetropia and Astigmatism (Spectacle magnification & Relative spectacle magnification). 12. Anisometropia and Aniseikonia. 13. Optics of Retinoscopy & Ophthalmoscopy.

- **Dispensing Optics:** 1. Ophthalmic lens materials and their characteristics. 2. Ophthalmic Prisms & Decentration (Prentice's rule). 3. Manufacturing of various types of spectacle lenses (Glass). 4. Manufacturing of various types of spectacle lenses (Plastic). 5. Aberrations & Ophthalmic lens design. 6. Transpositions – Simple and Toric. 7. Absorptive lenses & Lens coatings. 8. Bifocals & Trifocals. 9. Multi-focal lenses/ Progressive addition lenses (PALs). 10. Lenses for High refractive errors. 11. Spectacle frame materials & their characteristics. 12. Spectacle frame types & its parts. 13. Measurement for ordering spectacle, I.P.D. (Distance & near), Marking/ centration, V.D. Calculation. 14. Frame selection: Cosmetic & fitting considerations. 15. Spectacle frames fitting, alignment & adjustment. 16. Special purpose spectacles.

OCULAR PHARMACOLOGY

1. Ocular Pharmacology: 1. Ocular Pharmacology: an introduction. 2. Autonomic nervous system. 3. Routes of drug administration. 4. Miotics, Mydriatics & Cycloplegics. 5. Anti-bacterial drugs & therapy. 6. Anti-fungal drugs & therapy. 7. Anti-viral drugs & therapy. 8. Anti-inflammatory drugs & therapy. 9. Anti-glaucoma drugs & therapy. 10. Ocular Preservatives. 11. Ocular Lubricants. 12. Local Anaesthetics. 13. Ocular dyes. 14. Ocular Antiseptics & Disinfectants. 15. Anti-Vascular Endothelial Growth Factor (Anti-VEGF) drugs. 16. Contact lens solutions.

CLINICAL REFRACTION & CONTACT LENSES

- **Clinical Refraction:** 1. Myopia 2. Hypermetropia 3. Astigmatism 4. Aphakia & Pseudophakia 5. Presbyopia 6. Keratoconus 7. Anisometropia and Aniseikonia 8. Accommodation and convergence. 9. Refraction room & test chart standards. 10. Retinoscopy (Principle & Method)- Static and Dynamic 11. Objective methods of refraction (Ophthalmoscopy, Auto-refraction & Keratometry). 12. Monocular subjective refraction methods. 13. Binocular subjective refraction methods. 14. Near correction methods. 15. Recent refraction methods: Phorometry. 16. Prescription of glasses.
- **Contact Lenses:** 1. Historical development of Contact lenses. 2. CL material & manufacturing of soft & RGP. 3. Optics of CL. 4. Design of CL & effect of parameter changes in the fitting. 5. Verification & Modification of CL. 6. Review of Anatomy & Physiology of anterior segment. 7. Cornea & CL wear. 8. Routine pre-fitting examinations. 9. Slit Lamp Techniques. 10. Fitting philosophies of Soft & RGP CL. 11. Care & Maintenance.

CLINICAL ORTHOPTICS

- **Clinical Orthoptics:** 1. General introduction. 2. Binocular vision & Space perception (Fusion, Diplopia, Correspondence, Stereopsis, Panum's area, Fixation disparity, Horopter, BSV, Retinal rivalry, Physiological diplopia, Stereopsis & monocular clues, Egocentric localization, Theories of Binocular vision). 3. Extra-ocular muscles Anatomy and Physiology. 4. Laws of ocular motility. 5. Uni-ocular & Binocular movements (Version & Vergence, Fixation & field of fixation). 6. Near vision complex (Accommodation, Convergence & Pupillary constriction). 7. Confusion & Diplopia. 8. Suppression. 9. Stereopsis. 10. Asthenopia & Diplopia. 11. Visual acuity assessment in children. 12. Cover, cover-uncover & alternate cover tests. 13. Heterophoria: Classification, examination & management. 14. Amblyopia: Definition, types,

examination & management. 15. Anomalous retinal correspondence (ARC): types & examination. 16. Pseudotropia & measurement of angle kappa. 17. Measurement of ocular deviation: Objective & subjective methods. 18. Exotropia: Classification, examination & management. 19. Esotropia: Classification, examination & management. 20. Alphabet Phenomena/ Pattern. 21. Cyclo-vertical deviations: Classification, examination & management. 22. Orthoptic instruments.

BASIC INVESTIGATIVE OPTOMETRY:

- **Basic Investigative Optometry:** 1. Syringing and lacrimal function tests. 2. Ophthalmoscopy: Direct & Indirect. 3. Tonometry: Schiottz, Applanation & Non-contact. 4. Colour vision testing. 5. Contrast sensitivity. 6. Glare testing. 7. Perimetry: Goldmann, Humphrey & FDT. 8. Pachymetry: Optical & Ultrasonic. 9. Keratometry. 10. Auto-refraction. 11. Lensometry. 12. Exophthalmometry. 13. Specular microscopy. 14. Fluorescein staining techniques. 15. Slit lamp Biomicroscopy.

COMMUNITY OPTOMETRY AND EYE BANKING

- **Community Optometry:** 1. Concepts of community Optometry. 2. Epidemiology of Blindness (General Principles). 3. Epidemiology of Blindness (Disease specific strategies). 4. Survey methodology. 5. Screening procedures in Optometry. 6. School Eye screening programme. 7. Primary eye care. 8. Organization of Out-reach services. 9. Organization of Reach-in programmes. 10. Rehabilitation of the visually impaired. 11. National programme for the control of Blindness (NPCB). 12. Vision 2020: The right to sight.
- **Eye Banking:** 1. Publicity. 2. How to donate your eyes. 3. Collection of donor eyes. 4. Preservation of eyes. 5. General concepts about corneal transplantation.

ADVANCED CONTACT LENSES AND LOW VISION

- **Advanced Contact lenses:** 1. Historical development of Contact lenses. 2. CL material & manufacturing of soft & RGP. 3. Optics of CL. 4. Design of CL & effect of parameter changes in the fitting. 5. Verification & Modification of CL. 6. Review of Anatomy & Physiology of anterior segment. 7. Cornea & CL wear. 8. Routine pre-fitting examinations. 9. Slit Lamp Techniques. 10. Fitting philosophies of Soft & RGP CL. 11. Care & maintenance. 12. CL fitting in astigmatism. 13. CL fitting in Keratoconus. 14. Bifocal & Multifocal CL. 15. CL in aphakia. 16. Paediatric CL fitting. 17. Disposable CL & Frequent Replacement Program. 18. Cosmetic & Prosthetic CL. 19. Therapeutic CL. 20. CL fitting in Post-refractive surgery cases. 21. CL for sports vision. 22. Scleral lens fitting. 23. Ortho-Keratology (Ortho-K). 24. Complications of soft CL & their management. 25. Complications of RGP CL & their management. 26. Diagnosis & management of Dry eye in CL wear. 27. Review of contact lenses available in INDIA.
- **Low Vision:** 1. Low vision: definition & psychosocial implications. 2. Classification & Management of functional visual deficit: Cloudy media, Central field deficit & Peripheral field deficit. 3. Low vision examination 4. Specialized testing in low vision. 5. Magnification associated with low vision devices. 6. Low vision devices (Distance). 7. Low vision devices (Near). 8. Low vision devices (Non-optical). 9. Rehabilitation of low vision patient.

ADVANCED OPTICS AND ORTHOPTICS

- **Advanced Optics:** 1. Physiological optical defects of eye. 2. Correction of Ammetropia: Myopia, Hypermetropia and Astigmatism (Spectacle magnification & Relative spectacle magnification). 3. Anisometropia and Aniseikonia. 4. Optics of Retinoscopy & Ophthalmoscopy. 5. Aberrations & Ophthalmic lens design. 6. Absorptive lenses & Lens coatings. 7. Bifocals & Trifocals. 8. Multi-focal lenses/ Progressive addition lenses (PALs). 9. Lenses for High refractive errors. 10. Special purpose spectacles.

- **Advanced Orthoptics:** 1. General introduction. 2. Binocular vision & Space perception (Fusion, Diplopia, Correspondence, Stereopsis, Pannum's area, Fixation disparity, Horopter, BSV, Retinal rivalry, Physiological diplopia, Stereopsis & monocular clues, Egocentric localization, Theories of Binocular vision). 3. Extra-ocular muscles Anatomy and Physiology. 4. Laws of ocular motility. 5. Uni-ocular & Binocular movements (Version & Vergence, Fixation & field of fixation). 6. Near vision complex (Accommodation, Convergence & Pupillary constriction). 7. Confusion & Diplopia. 8. Suppression. 9. Stereopsis. 10. Asthenopia & Diplopia. 11. Visual acuity assessment in children. 12. Cover, cover-uncover & alternate cover tests. 13. Heterophoria: Classification, examination & management. 14. Amblyopia: Definition, types, examination & management. 15. Anomalous retinal correspondence (ARC): types & examination. 16. Pseudotropia & measurement of angle kappa. 17. Measurement of ocular deviation: Objective & subjective methods. 18. Exotropia: Classification, examination & management. 19. Esotropia: Classification, examination & management. 20. Alphabet Phenomena/ Pattern. 21. Cyclo-vertical deviations: Classification, examination & management. 22. Orthoptic instruments. 23. Neurogenic palsies (acquired & congenital). 24. Myogenic palsies (Myasthenia gravis, Chronic progressive external Ophthalmoplegia & Orbital pseudotumour). 25. Mechanical disorders of ocular motility (Duane's retraction syndrome, Brown's syndrome, Strabismus fixus & Adherence syndrome). 26. Nystagmus: Classification, examination & management. 27. Principles of non-surgical treatment.

CLINICAL INVESTIGATIVE OPTOMETRY

Clinical Investigative Optometry: 1. Syringing and lacrimal function tests. 2. Ophthalmoscopy: Direct & Indirect. 3. Tonometry: Schiottz, Applanation & Non-contact. 4. Colour vision testing. 5. Contrast sensitivity. 6. Glare testing. 7. Perimetry: Goldmann, Humphrey & FDT. 8. Pachymetry: Optical & Ultrasonic. 9. Keratometry. 10. Auto-refraction. 11. Lensometry. 12. Exophthalmometry. 13. Specular microscopy. 14. Fluorescein staining techniques. 15. Slit lamp Biomicroscopy. 16. Gonioscopy. 17. Corneal Topography. 18. Ultrasonography. 19. Fluorescein angiography. 20. ERG, EOG & VER. 21. Dark adaptometry. 22. Ocular Photography (Anterior segment). 23. Laser-interferometry/ PAM (Potential Acuity Meter) 24. Refractive surgery (RK, PRK, Excimer laser & Lasik). 25. Paediatric eye examination. 26. Recent advances.

SYLLABUS FOR THE POST OF TRANSPORT SUPERVISOR

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Candidates' understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability would be tested.

E. Subject Knowledge (40 Marks):

Questions on Driving Technique & Motor Car Mechanism shall aim at testing the candidate's knowledge of driving skills and procedures, duties of drivers, fuel efficiency and fuel economy, basic maintenance of the vehicle, servicing, emergency handling techniques, tools and documents required with the vehicle, types of vehicles, traffic Rules & Regulations, ability to

recognize traffic signals, traffic signs, hand signals and road markings, simple queries about the assemblies of vehicle systems, etc. Basic Life Support and Knowledge of First AID, Pollution and Environment, Causes and types of accidents, Drivers responsibility in the event of accident, road rage and stress management. Basic knowledge of AIDS.

SYLLABUS FOR THE POST OF VOCATION COUNSELLOR

Subject Knowledge (100 Marks):

A. Nature and concept of guidance, types of guidance (10 Marks):

- Nature and scope of guidance.
- Concept, definition, basic assumptions and principles of guidance.
- Importance of understanding the individual, Barriers to understanding, Aids in understanding, measurement and application of self-understanding, Guidance movement in India.
- Educational Guidance: Nature, Pupil personnel work, pupil appraisal information,
- Role of teacher, Preparation and training, School curriculum and guidance,
- Vocational guidance: Nature, study of occupations, occupational information, Theories of occupational choices, Job placement and Satisfaction.

B. Information and techniques essential for effective guidance (10 Marks):

- Personal Guidance: Nature of emotional problem, adjustment problems of adolescents and delinquents: prevention and treatment.
- Achievement and aptitude tests, Personality and interest inventories, School records and reports
- Occupational information: Collection, Classification and dissemination.
- Individual and Group guidance.
- Organization of guidance programmer: Types and basic procedures.

C. Stages of human development and areas of guidance (10 Marks):

- Characteristics of different stages of development (Physical, Cognitive, Emotional, Social and Moral).
- Problems of childhood and adolescence.
- Problems of adulthood and aged.
- Role of teacher in providing guidance services.

D. Meaning & types of counselling (10 Marks):

- Meaning, Historical development and Importance of Counselling
- Individual and Group Counselling
- Emerging Trends in Counselling

E. Approaches of counselling (10 Marks):

- Approaches of Counselling: Directive, Non directive, and Elective.
- Qualities and Professional Ethics of a Counsellor.

F. Areas of counselling (Counselling Skills) (10 Marks):

- Counselling Families Concerning
- Children, Counselling with Parents,
- Counselling the Delinquent, Marriage
- Counselling, Premarital Counselling,
- Counselling the Handicapped, Career Counselling, and Adolescent Counselling.

- Role of Counsellor in developing Good Mental Health.
- Building Trust: Listening, Attending,
- Observing, Building Rapport, Demonstrating Empathy.
- Specialized Concerns in Counselling: Substance Abuse, Drug Addiction; HIV AIDS; Child Abuse (Trauma); Internet and Technological Abuse.

G. Counselling for exceptional children and adolescents (10 Marks):

- Types of different abilities.
- Needs & Problems of children and adolescents with different abilities
- Importance of counselling of students with different abilities and their parents, family and peers.

H. Identification and diagnosis of problem areas (10 Marks):

- Identification of personal, Social & academic problems of children (5-12 year) at elementary level
- Identification of academic, social & vocational needs & problems of adolescents (13 to 18 years) at secondary level.
- Diagnosis of Problem areas, stress as a cause of Mental, Emotional, Physical, Social behaviour and academic problems.

I. Intervention programmes (10 Marks):

- Individual and group counselling of children and adolescents for emotional, social, behavioural and academic problems.
- Relaxation strategies, yoga & meditation therapies for children and adolescents for reducing stress and other related problems.
- Meaning and historical development of career counselling
- Concept of Career development.
- Different stages of career development.
- Emerging career options in present context.

J. Career development (10 Marks):

- Bases of Career Development
- Vocational Development: reports of various educational commissions and committees.
- Identifying and analysing career choices and career talents.
- Need for career education in schools.
- Present Conditions and Career Education
- Changing economic conditions of society and the job market.
- Psycho-social conditions of the individuals.
- Advancement of technology and survival skills.
- Problems pertaining to work, family, education and leisure.
- Career choice and Decision Making
- Career maturity: concepts and factors.
- Empowering students in career decision making (strategies)
- Matching career talents with career decision making.
- Guidance for developing life goals & choices
- Pillars of Education and Life Skills

- Need for Life Skills Education.
- Importance of Life Skills for Growing Minds.
- Components of Life Skills. Importance of Emotional, Social and Thinking Skills.
- Concept of Four Pillars of Education:
- Learning to Know, Learning to Do, Learning to Live Together, and Learning to Be.

SYLLABUS FOR THE POST OF WARDEN (HOSTEL WARDEN)

A. General Intelligence & Reasoning (10 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (5 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (10 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart

D. English Language (5 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Basic concepts of Management & Computers (10 Marks):

Principles of Management, Organisation behaviour, MS Office, MS Windows, Fundamentals of Computers, Internet etc.

F. Knowledge of Housekeeping, Material Management, Public Relations and Estate Management (80 Marks)

SYLLABUS FOR THE POST OF WIREMAN

A. General Intelligence & Reasoning (15 Marks):

It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualization, spatial orientation, problem solving, analysis, judgement, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning and figural classification, arithmetic number series, non-verbal series, coding and decoding, statement conclusion, syllogistic reasoning etc. The topics are, Semantic Analogy, Symbolic/Number Analogy, Figural Analogy, Semantic Classification, Symbolic/Number Classification, Figural Classification, Semantic Series, Number Series, Figural Series, Problem Solving, Word Building, Coding & decoding, Numerical Operations, symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern –folding & unfolding, Figural Pattern – folding and completion, Indexing, Address matching, Date & city matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence, Other sub-topics, if any.

B. General Awareness (15 Marks):

Questions in this component will be aimed at testing the candidate's general awareness of the environment around him and its application to society. Questions will also be designed to test knowledge of current events and of such matters of every day observations and experience in their scientific aspect as may be expected of any educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining History, Culture, Geography, Economic Scene, General Policy & Scientific Research.

C. Quantitative Aptitude (15 Marks):

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The scope of the test will be computation of whole numbers, decimals, fractions and relationships between numbers, Percentage. Ratio & Proportion, Square roots, Averages, Interest, Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centres, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles, Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square base, Trigonometric ratio, Degree and Radian Measures, Standard Identities, Complementary angles, Heights and Distances, Histogram, Frequency polygon, Bar diagram & Pie chart.

D. English Language (15 Marks):

Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Misspelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.

E. Subject Knowledge (40 Marks):

- **Basic Electricity:** Fundamental of Electricity, Flux and soldering technique, Property of Resistance, Conductor, Insulator, Semi-conductor, Types of wires and cables.

- **Ohm's Law:** Ohm's Law, Kirchoff's law, Effects of variation of temperature on resistance, Chemical effect of electric current, Laws of resistance, Different type of cells, Grouping of cells, Care and maintenance of cell, Buckling, Sedimentation
- **Magnetism:** Classification of magnetic properties, Para, dia and ferromagnetic material, Electromagnetism, Fleming's left and right hand rule, MMF, Flux density, Reluctance, Faraday's laws of electromagnetic induction, Len'z law, Capacitor, Types of functions
- **Alternating current and Earthing:** Alternating current, Earthing, Types of wiring both domestic and industrial, Grading of cable and wires, Current rating, Testing of installation by megger
- **DC Machine:** DC Generators and Type, EMF equation, Description of series, shunt and compound Generator, DC motors and type, Starter 3 point, 4 point and speed control machine
- **AC Motors, single and 3 phase:** AC motors and starters single phase and 3 phase, DOL, Star delta, slip ring motor starter, Auto transformer starter, AC motor panel wiring, Phase sequence
- **Instruments and Transformers:** Measuring Instruments, Indication type and Deflecting types, Controlling torque and Damping Torque, Basic principle of Transformer, emf equation of transformers, Parallel operation of Transformers, Cooling, Protective Device
- **Illumination and Basic Electronics:** Illumination- Laws of illumination, Type of lamp, Domestic appliances, Semiconductor- P type, N type, Classification of Diode, Rectifier, Transistor
- **Power Generation:** Generation Source of energy, Various types of power generation
- **Transmission:** Transmission and Distribution, Comparison of AC and DC transmission.

SYLLABUS FOR THE POST OF YOGA INSTRUCTOR

Subject Knowledge (100 Marks):

1.1 Introduction to Yoga and Yogic practices

- Etymology of Yoga and definitions of Yoga in different Classical Yoga texts
- Brief introduction to origin, history and development of Yoga
- Aim, Objectives and Misconceptions about Yoga
- General Introduction to *Shad-darshanas* with special reference to *Sankhya* and Yoga
- General introduction to four paths of Yoga
- Principles of Yoga and Yogic practices
- Guidelines for Instructors

1.2 Introduction to Hatha Yoga

- Distinction between Yoga Asana and Non-Yogic physical practices
- Introduction to important Hatha Yoga Texts with special reference to Hatha Yoga Pradipika and Gheranda Samhita
- Concept of Yogic Diet
- Causes of Success (*Sadhaka Tattwa*) and Causes of Failure (*Badhaka Tattwa*) in Hatha Yoga *Sadhana*
- Concept of *Ghata* and *Ghata Shudhhi* in Hatha Yoga
- Purpose and utility of *Shat-kriya* Hatha Yoga
- Purpose and utility of Asana in Hatha Yoga
- Purpose and importance of *Pranayama* in Hatha Yoga

1.4 Introduction to Patanjali

- Definition, nature and aim of Yoga according to Patanjali
- Concept of *Chitta* and *Chitta Bh umis*
- *Chitta-vrittis* and *Chitta-vrittinirodhopaya* (*Abhyasa* and *Vairagya*)
- Concept of *Ishwara* and *Ishwara Pranidhana*
- *Chitta Vikshepas* (*Antarayas*) and their associates (*Saiibhuva*)
- Concept of *Chitta Prasaduna* and their relevance in mental well being
- *Kleshas* and their significance in Yoga
- Ashtanga Yoga of Patanjali : its purpose and effects, its significance

2.1 Introduction to human systems, yoga and health

- The nine systems of human body
- Functions of different systems of human body
- Introduction to Sensory Organs
- Neuromuscular co-ordination of Sensory Organs
- Basic understanding of Exercise Physiology
- Homeostasis
- The benefits of various *asana* on different parts of the human body
- The limitations and contra-indications of specific Yoga practices

2.2 Yoga for wellness- prevention and promotion of positive health

- Health, its meaning and definitions
- Yogic conceptions of health and diseases

- Concept of Pancha kosha
- Concept of Triguna
- Concept of Yogic principles of Healthy-Living
- Introduction to yogic diet and nutrition

2.3 Yoga and stress management

- Human Psyche: Yogic and modern concepts, Behavior and Consciousness
- Frustration, Conflicts, and Psychosomatic disorders
- Relationship between Mind and Body
- Mental Hygiene and Roll of Yoga in Mental Hygiene
- Mental health: a Yogic perspective
- Prayer and meditation for mental health
- Psycho-social environment and its importance for mental health (yama, and niyama)
- Concept of stress according to modern science and Yoga
- Role of Yoga in Stress management
- Role of Yoga for Life management

3.1 The movement of key joints of the body and the demonstrated ability to perform the same — Neck, Shoulder, Trunk, Knee, Ankle 5

3.2 *Sukshma Vyayama and Shat Karma*

Neti, Dhauti, Kapalabhati, Agnisaar, Kriya, Trataka

Surya Namaskar and Asana:

4.1 *Suryanamaskar* (Sun Salutation)

a. Knowledge and Demonstration ability to perform *Suryanamaskar*

4.2 *Asana:*

a. Knowledge of upto basic postures as below and demonstrated ability to perform these postures.

- *Saravangasana* (shoulderstand)
- *Halasana* (plough)
- *Matsyasana* (fish)
- *Paschimottanasana* (sitting forward bend)
- *Bhujangasana* (cobra)
- *Salabhasana* (locust)
- *Dhanurasana* (bow)
- *Ardh matsyendrasana* (half spinal twist)
- *Kakasana* or *bakasana* (crow)
- *Padahasthasana* (standing forward bend)
- *Trikonasana* (triangle)

b. Knowledge of another five *asanas* chosen by the applicant and demonstrated ability to perform the same.

c. Knowledge of the Sanskrit names of the postures and breathing exercises, detailed benefits and caution.

- d. Knowledge of the five spinal movements — inverted, forward, backward, lateral twist and lateral bend and neutral positions of the spine
- e. Knowledge of 360 degree, all round, Yogic exercise through the practice of *asanas*, proper relaxation, proper breathing, contra-indications, cautions and medical considerations; obvious and subtle benefits; and modification in basic postures to accommodate limitations

Pranayama and Practices leading to Meditation

5.1 **Pranayama**

- a. Familiarity with and Demonstrated ability to perform abdominal (and diaphragmatic), thoracic, clavicular breathing and the full Yogic breath.
- b. Familiarity with and Demonstrated ability to perform *Anuloma Viloma, Bhastrika, Chandrabhedha, Suryabhedhana, Ujjayi, Bhramari, Sheetal, Sheetkari*, and the knowledge of its benefits, limitation and applications.

5.2 *Practices leading to Meditation*

- a. Familiarity with and Demonstrated ability to perform *Dharana* and *Dhyana* and to demonstrate allied practices like *Madras, Mantra Japa*.
- b. Familiarity with the concept of environment for meditation and the benefits of meditation on health and well-being and its practical application in modern life.

Teaching Practice

6.1 **Knowledge of**

- a. The scope of practice of Yoga and how to assess the need for referral to other professional services when needed
- b. Observed capacity for, well-developed communication skills: listening, presence, directive and non-directive dialogue.

6.2 **Demonstrated ability**

- a. To recognize, adjust, and adapt to specific aspirant needs in the progressive classes.
- b. To recognize and manage the subtle dynamics inherent in the teacher aspirant relationship.

6.3 **Principles and skills for educating aspirants**

- a. Familiarity with and demonstrated ability to apply effective teaching methods, adapt to unique styles of learning, provide supportive and effective feedback, acknowledge the aspirant's progress, and cope with difficulties.

6.4 **Principles and skills for working with groups**

- a. Familiarity with and Demonstrated ability to design and implement group programs.
- b. Familiarity of group dynamics and allied techniques of communication skills, time management, and the establishment of priorities and boundaries.
- c. Familiarity with techniques to address the specific needs of individual participants, to the degree possible in a group setting.
