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Subject-wise Syllabus for 'Technician (Maintenance)'-Post
Pay Level -2 of 7th CPC Pay Matrix

Indicative Syllabus for Examination:

i. Relevant Field

a. Electrician:

Basic Electrical Concepts: Electrical quantities: Voltage, Current, Resistance, Power, Energy, SI units, Ohm's Law, Electrical symbols, Series and parallel circuits

DC Circuits & Laws: Kirchhoff's Current Law (KCL), Kirchhoff's Voltage Law (KVL), EMF and internal resistance, DC circuit analysis, Electrical power and energy calculations

AC Fundamentals: Alternating current & voltage, Frequency, time period, RMS, average and peak values, Power factor, Single-phase AC circuits

Electrical Measuring Instruments: Ammeter, Voltmeter, Wattmeter, Energy meter, Multimeter, Megger & Earth tester, Instrument connections and errors

Transformers: Construction and working principle, Step-up and step-down transformers, Losses in transformers, Efficiency and applications, Transformer ratings

Electrical Machines (Motors): DC motors: types and applications, Single-phase induction motors, Three-phase induction motors, Star-Delta and DOL starters, Motor protection basics

Wiring & Installation: Types of wiring: Cleat, Batten, Casing & capping, Conduit, Domestic and industrial wiring, Cable types and sizes, Colour codes

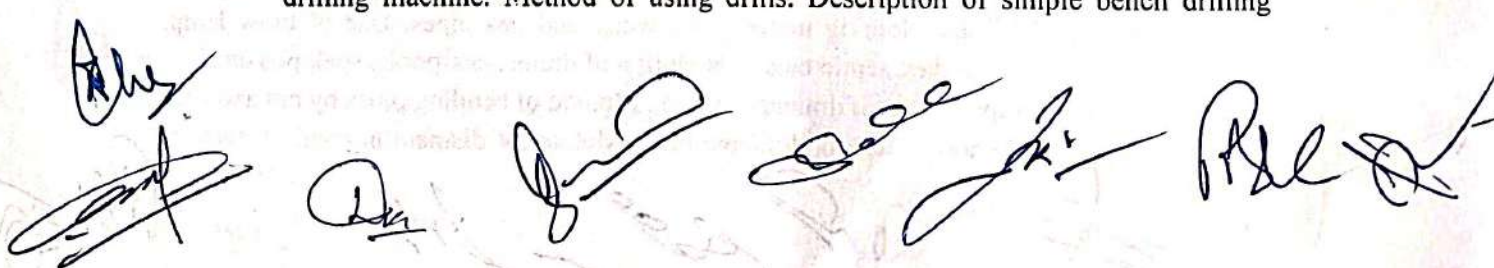
Earthing & Electrical Safety: Purpose of earthing, Types of earthing, Electrical hazards, Safety rules and PPE, First aid for electric shock

Switchgear & Protection: Fuses and fuse ratings, MCB, MCCB, RCCB / ELCB, Relays (basic), Circuit breakers (introductory)

Power System & Trade Awareness: Power generation (basic idea), Transmission and distribution system, Substations (basic components), Overhead lines and underground cables, Electrical tools, maintenance & testing

b. Plumber:

Scope of a plumbing work. Types of services have to plan. Basic Bench fitting. Plumber's common hand tools - names, description and material from which they are made. Description, types and uses of holding device, hammers & cold chisels, cutting tools. Description of simple fitting operations hack sawing, punching and filing. Types of files used commonly. Marking instruments and their use of simple drilling machine. Method of using drills. Description of simple bench drilling



Machine. Description of Grinding and Chisel. Description of different types of locking and fastening devices. About different types of pipes-GI, CI, DI, PVC/CPVC, PPR, AC and HDPE etc. About different Types of Pipe Fittings:- Socket, Elbow, Tee, Union, Bend, Cap, Plug, Cross, Ferrule etc. About different types of Thread cutting.

Carpenter works :- Description and uses of Carpenter's hand tools used for simple operations such as marking, sawing, planing and making simple joints. Common types of wood their description and use.

Gas Welding :- Purpose of Gas welding. Method of gas welding, Safety precautions to be observed -Methods of soldering and brazing - fluxes used & Types of fluxes precautions to be observed.

Mason's works :- Names and description of Mason's hand tools and their uses. Method of making holes in walls and floors. Types of tools used and various Processes.

Concept of bricks, lime and cement. Preparation of mortars with various materials of varying composition. Common brick joints. Description of bonds.

Scaffolding & plastering. Define Plain cement concrete, RCC and its proportion, Grades of coarse aggregate and fine aggregate, Knowledge of waterproofing compound. Knowledge of Building Plan and Cross section of wall. Identify plumbing services required for each type of building according to usage.

Description of plumber tools and Equipment Ratchet brace, Threading die, Pipe wrench, Sliding wrench, Spanner set, Chain Wrench etc. and their safety. Care & use of tools. Pipes of different kinds Method of Pipe bending in different dia.

Plumbing Symbols and Code for Tools & Materials on water line. Equipment and tools for hot gas welding and electric hot plate for PPR pipe joints. Types of fittings for different joints & different pipes:- CI, HCI, AC, AC Pressure, DI, GI Pipes. Joints:-Flange joint, Socket joint with lead, Detachable joint, Socket & Spigot joints etc. Description of pipe fittings. Methods of joining and their uses. Precautions to be taken while fixing. Different kinds of Joints, Fittings and Materials in joining pipes :- PVC/CPVC, PPR and HDPE etc.

Composition of Water :- Sources of water, Hard & Soft water, temporary hardness & permanent hardness. Impurities of water - organic and inorganic impurities. Water purification stages and methods. Static water pressures and measurement of pressures. Bursting pressure, Expansion of water on freezing and heating. Bernoulli's principles, Pascal's law. Pressure of water on the sides of cistern or tank. Water hammer in pipes. Use of hummed and asbestos pipes of different sizes. Method of laying out pipes alignment and joining. Description of various pipe joints- straight, Branch, Taft and blow, Expansion joints. Solders and fluxes used in joints. Description of Plumber's materials Lead, tin, Zinc, solder, copper, red lead etc. and their uses. Water supply system of a small town. Description and types of pumps viz. suction pump, Centrifugal pump etc. Contamination of water in a well. Description of pipe dies, their uses, care and precaution. Metric specification of various pipes. Standard pipe threads. Method employed for bending, Joining and fixing PVC pipe. Joining material for water and gas pipes. Use of blow lamp. Inspection chamber, septic tank, description of drains, cesspools, soak pits etc.

Types of traps, layout of drainage system, Method of bending pipes by hot and cold process. Method of testing drainage lines, Method of dismantling and renewal of

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the valves and pipes. Leaks in pipes and noises in plumbing. Installation of water meters. Air lock in pipes and its removal. Description of cocks & valves-their types, materials & advantages for particular work. Erecting rain water and drainage pipe system, Installation of sanitary fittings, inspection and testing of water supply system. -Pipe alignment and slope. -Prevention of water hammer. Storage tanks for general water supply propose. Test for water supply pipes. Description of sanitary fittings, General points to be observed when choosing sanitary, Method of bending galvanized mand other heavy pipes.

Domestic drainage system: General layout, one pipe system, specifications of Materials required. Method of testing leakage. Different types of traps, ventilation, antisiphonage and sinks. About Fire hydrants and their fittings.

Concept of heat and Temperature. Method of transmission of heat. Heating system by different thermal units. Domestic hot and cold water. General layout, specification of materials required and Connection of pipes to mains. Tracing leakage. Repairs to service main. Domestic boilers and Geysers. Method of ventilating pipe. Precaution against air Poisoning. Fixing of solar water system.

Plumbing and sanitary symbols and plumbing codes for all tools and materials. Sensor system for urinals and was basin, etc. Corrosion - causes and remedies, prevention. Corrosion due to electrolytic action, Effect of water and frost on materials. Layout of pipes as per drawing.

c. Carpenter:

Introduction of carpentry trade. General discipline, workshop discipline & Housekeeping. Safety precaution in the workshop and industrial safety. Importance of P.P.E, Types of PPE and their application. Introduction of timber, growth of timber trees, cross-section of exogenous tree trunk, types of tree, different part of a tree, Soft & hard wood, their differences. Common Indian timbers. Defects in timber, diseases of timber, knots, shakes, grains etc. Introduction of carpentry hand tools, classification and uses of marking, work holding devices. Measuring & testing tools. Type of bench vice and their uses. Introduction of different saw and their uses. Introduction of power circular saw and its use. Type of special saw and its uses i.e. -compass saw, coping saw, bow saw, fret saw. Saw sharpening and sharpening tools. Description of boring tools - Types, Parts, functions, size and application. Description of portable electrical drill machine. Drill bits, types, sizes etc. Hand augers description, sizes of augers, application of hand augers. Type of different planes and their proper uses in woodwork - Description, function and its size, setting, knowledge of sharpening and uses etc. Knowledge of using marking gauges. Important instruments necessary for checking flatness and twistness of surface. Sharpening and grinding angle of cutter. Portable power planer-useful in modern woodwork and new technology design. Different type chisels - Definition, identification, their uses. Necessity of grinding and sharpening, Striking tools- Definition, types, application. Files Types, uses, Care & maintenance of files, Function of work bench, bench vice, bench hook, etc. Seasoning of timber- Definition, advantage and disadvantage of seasoning. Moisture content in timber and its effect on timber. Characteristics of wood, physical and mechanical properties of wood. Quality of good timber. Define the classification of wooden joint. Description of different types joint, Uses of joint: Framing joint angle joint and

lengthening joint etc. Preservation of timber. Application of different types of preservation & Process of each treatment. Definition of housing joint. Different type of housing joint, Uses of housing joint. Description of different dovetail joint and their function. Uses of dovetail joint. Glues-Types of glue and their uses, Broadening joint description. Types of broadening joint. Application of broadening joint. Setting of end side according to annual Rings as well as matching the grain stranding. Advantage of adhesives use and their types. Method of Dowel application lengthening joint. Types of lengthening joint. Application of different Veneer, Plywood, Types of plywood, Advantage of plywood, Application of plywood, block board, laminated board, hard board, Insulation board, mica etc. Parts & terms of portable disc sander. Application of portable disc sander. Care & maintenance of disc sander. Method of making a wooden partition. Door frames. Door & window panels. Calculation of timber required for stool. List out the sequence of operation of the job. Timbers used in furniture work-describe Sal, teak, gamar, pine, deodar etc. Properties and characteristics of different furniture wood. Conversion and types of conversion. Parallel sawing Radial sawing Quarter sawing Tangential sawing Process and advantage, Design of wooden wall unit uses in bed room, dining hall, library, office, workshop classroom. Uses of joint for small table to stranger strength. Manufacturing process of various boards and sheets. Types of hinges, Uses of hinges, Types of door lock & their different uses, Nails and screws-Nail and screws-type, Uses etc. Nut, bolts and washer-types and Uses, Lock hinges hasp and staple. Knowledge of other fittings-types, sizes and lenses, Description of different carving tools. Tools required for ornamental carving. Properties of wood. Paints, ingredients of paints. Name of the agent of paints. Method of preparation of surface for stairing. Necessary tools and equipment required for staining. Uses of different grade sandpaper. Portable sander machine uses, Preparation of putty and use. Staining-type, process, methods applied for different timber. Description & method of French polish. Method of wax polish and its uses. Methods of old furniture re polish. Estimation process of wooden furniture, Describe constructional features of band saw machine. Types of band saw machine. Sizes of band saw machine. Parts of band saw machine. Function of band saw machine. P.P.E for band saw machine, Operation of band saw machine. Safety precaution of bad saw machine. Care & maintenance of band saw machine with oiling & greasing, Describe circular saw machine. Types of circular saw machine. Sizes of circular saw machine. Identify the parts of circular saw machine. Function of circular saw machine. Different types of saw blades used in circular saw machine. Safety precaution of circular saw machine. Care & maintenance of circular saw machine with oiling & greasing. Operation of portable type circular saw machine. Safety precautions, P.P.E for the circular saw machine, Describe of planning machine. Types of planning machine. Sizes of planning machine. Parts of surface/thickness planning machine, Function of surface/ thickness planning machine. P.P.E for the surface/thickness planning machine. Operation of surface/thickness planning machine. Safety precaution of surface/thickness planning machine. Care & maintenance of surface/thickness planning machine, Oiling & greasing, Pedestal grinding machine - Description, Types, Sizes, Parts, Function, Operation of pedestal grinding machine. Safety precaution and P.P.E for the pedestal grinding machine.

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Care & maintenance of pedestal grinding machine with oiling & greasing, Pedestal drilling machine - Description, Types, Sizes, Parts, Function, Operation of pedestal drilling machine. Safety precaution and P.P.E for the pedestal drilling machine, Care & maintenance of pedestal drilling machine with oiling & greasing, Types of drill bits used in drill machine. Wood turning lathe Description, Types, Sizes, Parts, Function, Types, Operation of wood turning lathe. Safety precaution and P.P.E for wood turning lathe. Care & maintenance of wood turning lathe with oiling & greasing. Types and application of set of chisels, Signature of cutting tools. Mortise machine-Description, Types, Sizes, Parts, Function, Operation of mortise machine. Safety precaution and P.P.E formortise machine. Care & maintenance of mortise machine with oiling & greasing Calculation of timber, weight, area, volume etc. Sanding machine-Description, Types, Parts of sanding machine. Safety precaution and P.P.E for sanding machine. Introduction of pattern, Different hand tool including contraction rule. Different allocation, Different shrinkage, Drafting, Pattern allowance, Different types of timber used in pattern making. Types of pattern and their uses. Application of colour code in pattern making. Reading of blue print and drawing, Layout board and its use. Dowel types, size and use in pattern making work. Multi-piece pattern complication and remedy, Types and uses of core and core print. Colour codes specification. Use of points on pattern, core, corebox is point. Estimate volume of wood and other requirement for pattern making box, General safety in fitting shop, Types of marking and cutting tools and their uses. (viz., marking block, chisels, hammer, hacksaw, files, etc.) Uses and maintenance of tools-Steel rule, try squares, scribe, divider, calipers and other tools. Marking table, marking block etc. Application of bench vice, clamps. Types of drill bits, counter boring tool, taps and dies used in fitting work. Types of nuts, bolts, washers, machine screws etc. Common sheet metal tools -Description, type and uses of hand tools for sheet metal work. Application of various types of hammer. Application of various types of stakes. Development of various type of shape, Development of drawing and layout simple pattern, Right concept of shearing, punching, folding, bending etc. Introduction about building construction. Different type door & windows and different size. Different type panel used for panel shutter, glazed shutter. Substitute of wood viz., block board, hard board etc. Description of window frame and shutter, Uses of frame and shutter of window, Definition of roof trusses, Terms of king post and queen post, Description of aluminium, Anodising of the aluminium windows, channel, section etc. Knowledge of different aluminium section, channels required for manufacturing the windows. Drilling of aluminium bar and joining by screw and adhesive, Knowledge of fibre glass, Introduce about rubber padding/gasket and aluminium wheel. Uses of channel window which is involved in building construction, Uses of P.V.C as substitute of wood. Give more get-up and cheapest in price, New style framing work. Madern technologies follow up P.V.C moulding. Advantages and disadvantage, Apply of removing old painting by new chemical then after repainting on furniture, Uses of new painting and priming on furniture, Purpose of using floor construction with different types of joist. Basic principal of repairing work, door window, staircase rack etc. Illustrate of nail screw bracket angle plate nut bolt, etc. Economic factors and material estimates. Hilti laser tools, types and their applications.

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ii. Arithmetic:

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The part will include questions on problems relating to number system, computation of whole numbers, decimals and fractions, relationships between numbers, fundamental arithmetical operations, percentage, ratio and proportion, average, interest, profit and loss, discount, use of tables and graphs, mensuration, time and distance etc.

iii. Mental Ability and Reasoning:

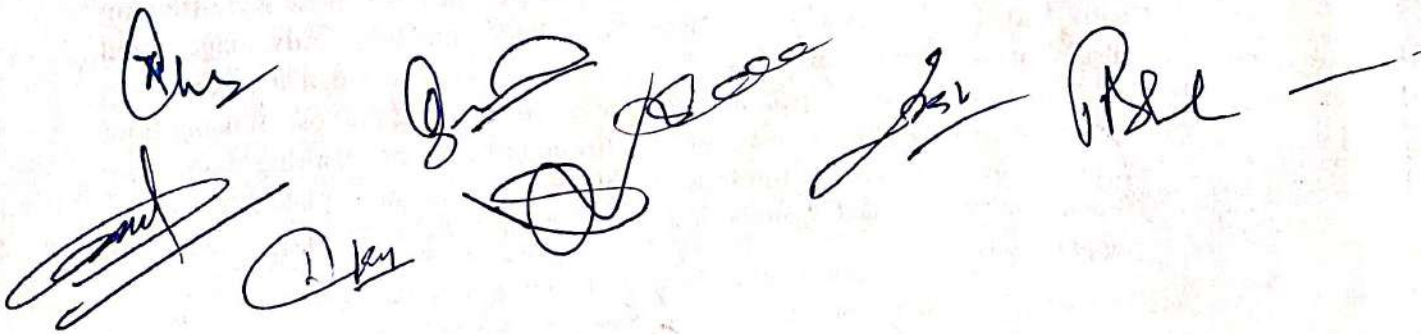
It would include questions of non-verbal type. The test will include questions on similarities and differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discriminating observation, relationship concepts, figure classification, arithmetical number series, 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.

iv. General Awareness :

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 event and of such matters of everyday observations 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 pertaining to History, Culture, Geography, Economic Scene, General Policy, General Science and Scientific Research.

v. General English:

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

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Subject-wise Syllabus for 'Technician (Maintenance)'-Post
Pay Level -2 of 7th CPC Pay Matrix

Indicative Syllabus for Examination:

i. Relevant Field

a. Information Technology:

Computer Organisation: Fundamentals of Computer and its use, Components of computer Block diagram of computer, function of various components of computer and CPU, storage devices used in computer, SSD vs. HDD, memory units, Operating System and its functions, types of operating system, Hardware and software in computers.

Introduction to WWW: Protocols and programs, secure connections, application and development tools, the web browser, server, Web Design: Web site design principles, planning the site and navigation, working knowledge of social media sites.

Introduction to HTML The development process, Html tags and simple HTML forms, web site structure Introduction to XHTML XML, Move to XHTML, Meta tags, Character entities, frames and frame sets, inside browser.

Style sheets: Need for CSS, introduction to CSS, basic syntax and structure, using CSS, background images, colors and properties, manipulating texts, using fonts, borders and boxes, margins, padding lists, positioning using CSS, CSS2.

PHP: Starting to script on server side, Arrays, function and forms, advance PHP Databases: Basic command with PHP examples, Connection to server, creating database, selecting a database, listing database, listing table names creating a table, inserting data, altering tables, queries, deleting database, deleting data and tables, PHP my admin and database bugs.

Database Management system: Database and its purpose, Components of a table, Relational Database Model, Terminology (Relation, Tuple, Attribute, Cardinality), Keys (Primary, Candidate, Alternate, Foreign), MYSQL AND DML Commands.

Networking and Internet: Need and benefits of networking, Components of a network, sender, receive, message, channel, Transmission Medium (wired and wireless), Types of Networking (LAN, MAN, WAN, PAN, VAN), Introduction and use of Internet Digital Literacy, Internet Devices: Repeater, Hub, Switch, Gateway, Bridge, Router, Data Transfer Rate (bps, Kbps, KBps, Mbps, MBPS, Gbps, GBPS) Network safety concerns: (Digital Footprints, Threats, Virus, Worm, Trojan Horse, Spam, Malware, DoS Attacks, Eavesdropping, Adware, Spyware, Snooping), Cyber Crime (Phishing, Pharming, Spoofing, Cyber Bullying, Hacking, Cracking, Identity Theft, Cyber Stalking, Cyber Trolling.

b. Pump Operator-Cum-Mechanic:

Fundamentals of Electricity- Voltage, Current, resistance, Energy, Energy, Power. Electrostatics and Electromagnetism- laws. Electric Flux, Potential Difference,

Potential, Permittivity, Permeability, Capacitors, Coulumb's Law, Faraday's Law, Magnetic Flux, Self-inductance, Fleming's law, etc. Fundamentals of AC systems- Generation, Equation of Voltage, amplitude, frequency, cycle, time period, Inductance, and Capacitance. Star and Delta connections. Direct Current Machines- DC generator. Alternate Current Transformers- its construction, types, principle. emf equation, transformation ratio, efficiency, and losses. Three-phase induction motor- principle, types, construction, slip. losses. torque, three-phase motor starters. Alternators, Three-phase synchronous motor, single-phase, and FHP single phase induction motor, AC series motor, Servomotor, Universal Motor, Split-phase, and Stepper motors. Automobile Engines- introduction, description of internal combustion, classification of IC engines, 2 and 4 stroke engines. Diesel Engine components, cooling systems, Lubricating systems, splash and pressure systems, Intake and exhaust systems. Air cleaners- description and functions, different types of air cleaners. Extraction mufflers. Diesel fuel system, Injection pump, Emission control, Braking systems. Charging circuit operation of alternators, regulator unit, ignition warning, remedy in charging system descriptions. Steering systems, Clutch, Manual Transmissions, rear-wheel drive, Suspension systems.

ii. Arithmetic:

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The part will include questions on problems relating to number system, computation of whole numbers, decimals and fractions, relationships between numbers, fundamental arithmetical operations, percentage, ratio and proportion, average, interest, profit and loss, discount, use of tables and graphs, mensuration, time and distance etc.

iii. Mental Ability and Reasoning:

It would include questions of non-verbal type. The test will include questions on similarities and differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discriminating observation, relationship concepts, 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.

iv. General Awareness :

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 event and of such matters of everyday observations 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 pertaining to History, Culture, Geography, Economic Scene, General Policy, General Science and Scientific Research.

v. General English:

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



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Subject-wise Syllabus for 'Multi-Tasking Staff-Post
Pay Level -1 of 7th CPC Pay Matrix

Indicative Syllabus for Examination:

Questions on 'General Intelligence and Reasoning' will be non-verbal considering the functions attached to the post. Questions on Numerical Aptitude and General English will be simple, of a level that an average matriculate will be in a position to answer comfortably. Questions on General Awareness will be also of similar standard.

English Language: Candidate's understanding of the Basics of English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. and writing ability would be tested.

General Intelligence and Reasoning: It would include questions of non-verbal type. The test will include questions on similarities and differences, space visualization, problem solving, analysis, judgment, decision making, visual memory, discriminating observation, relationship concepts, 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.

Numeric Aptitude: This paper will include questions on problems relating to Number Systems, Computation of Whole Numbers, Decimals and Fractions and relationship between Numbers, Fundamental arithmetical operations, Percentages, Ratio and Proportion, Averages, interest, Profit and Loss, Discount, use of Tables and Graphs, Mensuration, Time and Distance, Ratio and Time, Time and Work, etc.

General Awareness: 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 neighboring countries especially pertaining to Sports, History, Culture, Geography, Economic science, 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.

For VH candidate of 40% and above visual disability, there will be no component of Maps/ Graphs/Diagrams/ Statistical Data in the paper.

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Subject-wise Syllabus for 'Stenographer Grade-II'-Post
Pay Level - 4 of 7th CPC Pay Matrix

Indicative Syllabus for Examination:

General Intelligence & Reasoning:

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, judgment, 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.

General Awareness:

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 everybody 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.

For VH candidates of 40% and above visual disability/cerebral palsy affected candidates and opting for scribe there will be no component of Maps/Graphs/Diagrams/Statistical Data in the General Intelligence & Reasoning/General Awareness Paper.

English Language & Comprehension:

In addition to the testing of candidates' understanding of the English Language, its vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, etc. his/her writing ability, would also be tested.

Skill Test in Stenography:

Candidates who obtain the qualifying marks in the Examination as may be prescribed by the Committee will only be called for the Skill Test. Committee may also prescribe the qualifying marks in each part of Examination. The skill test will be of qualifying nature and the Committee will fix the qualifying standards in the skill test for different categories of candidates.

The candidates will have to appear for the stenography test. The candidate will be given one dictation for 10 minutes in English/Hindi at the speed of 80 w.p.m. for the post of Stenographer Grade-II. The matter will have to be transcribed on computer. The transcription time is as follows:-

For Stenographer Grade II: 50 minutes (English)

65 minutes (Hindi)

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Subject Wise Syllabus for 'Library Information Assistant'-Post
Pay Level 6 of 7th CPC Pay Matrix

Indicative Syllabus for Examination:

1. Library Science:

- Development of Libraries in India; Role of Library and Information Centers in Modern Society; Laws of Library Science
- Library Legislation in Indian States; Model Public Library Act; IPR; Cyber Laws
- Professional Associations in India, National and International Organizations
- Management of Library and Information Centers: Financial and Human Resources Management; Collection Development
- Library Classification; CC and DDC; Notation and Construction of Classification Number; Call Number
- Library Cataloguing: CCC 5th Edition; AACR Latest Edition; MARC; ISBD; CCF; ISBN and ISSN
- Indexing and Abstracting
- Circulation and Maintenance; Shelving, Stock Verification
- Information Products and Services
- Digital Library; Library Automation; Internet Based Library and Information Services

- 2. General Awareness & General Intelligence:** Questions will be designed to test the general awareness of the environment and its application to the 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 Polity & Scientific Research.

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 & de-coding, 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.

- 3. Quantitative Aptitude:** 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

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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 Alligation, Time and distance, Time & Work, Basic algebraic identities of School Algebra & Elementary surds, Graphs of Linear Equations, Triangle and its various kinds of centers, 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.

4. English Language: Candidate's ability to understand correct English, his basic comprehension, vocabulary, grammar, sentence structure, synonyms, antonyms and its correct usage, writing ability would be tested.

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Subject-wise Syllabus for Technician Field/Lab Research' Post
Pay Level -3 of 7th CPC Pay Matrix

i. Basic Science:

Chemistry

Some basic concepts of Chemistry, Structure of atom, Classification of elements and Periodicity in properties, Chemical bonding and Molecular structure, States of matter: Solid, Liquid and Gas, Thermodynamics, Equilibrium, Redox reactions, Hydrogen, s-Block elements (Alkali and Alkaline earth metals), Group 13 and 14 p-Block elements, Organic chemistry-some basic principles and techniques, Hydrocarbons, Environmental Chemistry.

Solid state, Solutions, Electrochemistry, Chemical kinetics, Surface chemistry, General principles and processes of isolation of elements, Group 15,16,17 & 18 p-Block elements, d and f Block elements, Coordination compounds, Haloalkanes and Haloarenes, Alcohols, Phenols and Ethers, Aldehydes, Ketones and Carboxylic acids, Organic compounds containing Nitrogen, Biomolecules (Carbohydrates, Proteins, Hormones, Vitamins, Nucleic acids), Polymers, Chemistry in everyday life (Chemicals in medicines, Chemicals in food, Cleansing agents).

Physics

Physical world and measurement, Kinematics, Laws of motion, Work, Energy and Power, Motion of system of particles and rigid body, Gravitation, Properties of bulk matter; Thermodynamics, Behaviour of perfect gas and Kinetic theory, Oscillations and Waves Electrostatics, Current electricity, Magnetic effect of current & magnetism, Electromagnetic induction and alternating current, Electromagnetic waves, Optics, Dual nature of Light, Atoms & nuclei, Electronic devices, Communication systems.

Biology

Diversity in living world, Structural organizations in Animals and Plants, Cell structure and function, Plant physiology (Transport in plants, Mineral nutrition, Photosynthesis, Respiration, Plant growth and development), Human physiology (Digestion and absorption, Breathing and Respiration, Body fluids and circulation, Excretory products and their elimination, Locomotion and Movement, Neural control and coordination, Chemical coordination and regulation).

ii. Arithmetic:

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The part will include questions on problems relating to number system, computation of whole numbers, decimals and fractions, relationships between numbers, fundamental arithmetical operations, percentage, ratio and proportion, average, interest, profit and loss, discount, use of tables and graphs, mensuration, time and distance etc.

iii. Mental Ability and Reasoning:

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,

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Subject-wise Syllabus for Lower Division Clerk Post
Pay Level -2 of 7th CPC Pay Matrix

297

i. Quantitative Aptitude:

Probability, Time and Distance, Quadratic Equations, Odd one out, Races and Games, Numbers and Ages, Averages, Mensurations, Profit and Loss, Problems on Numbers, Pipes and Cisterns, Indices and Surds, Simple Equations, Permutation and Combination, Simple & Compound Interest, Boat and Streams, Simplifications and Approximations, Mixture and Allegations, LCM & HCF, Time & Work, Problems on Trains, Ratio and Proportion, Areas, Volumes and Percentage etc.

ii. English Language:

Antonyms, Synonyms, Active and Passive Voice, Substitution, Sentence Improvement, Spelling Test, Passage Completion, Idioms and Phrases, Transformation, Prepositions, Fill in the Blanks, Spotting Errors, Para completion, Joining Sentences etc.

iii. General Awareness:

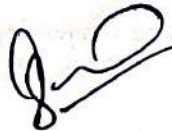
Indian History, Indian Culture & Heritage, Current Events-National & International, Indian Polity, Indian Constitution, General Science & Technology, Indian Geography, IT & Space, Indian Economy etc.

iv. General Intelligence:

Analogies, Similarities and differences, Space Visualization, Spatial orientation, Problem-solving, Analyst, Judgment, Decision making, Visual memory, Discrimination, Observation, Relationship concepts, Arithmetical reasoning and figural classification, Arithmetical number series, Non-verbal series, coding and decoding, syllogistic reasoning, clocks, Odd one out, Symbolic/Number classification, letter series, shapes and mirrors, Venn Diagrams etc.

 Vikas











Subject-wise Syllabus for Forest Guard Post
Pay Level -2 of 7th CPC Pay Matrix

296

i. Basic Science related to Forestry:

Nature of Universe General Scientific Laws - Mechanics Properties of Matter, Force, Motion and Energy - Everyday application of the basic principles of Mechanics, Electricity and Magnetism, Light, Sound, Heat, Nuclear Physics, Laser, Electronics and Communications. Elements and Compounds, Acids, Bases, Salts, Petroleum Products, Fertilizers, Pesticides, Soil types of India. Classification of Plants, Evolution, Genetics, Physiology, Nutrition, Health and Hygiene. Environment and Ecology, Biodiversity and Conservation, Environmental issues, Environmental conventions, Biogeochemical cycles. Forest Types of India, Wildlife Parks and Sanctuary, Ramsar sites, Wetlands, Non timber Forest product derived from forests.

ii. Arithmetic & Reasoning

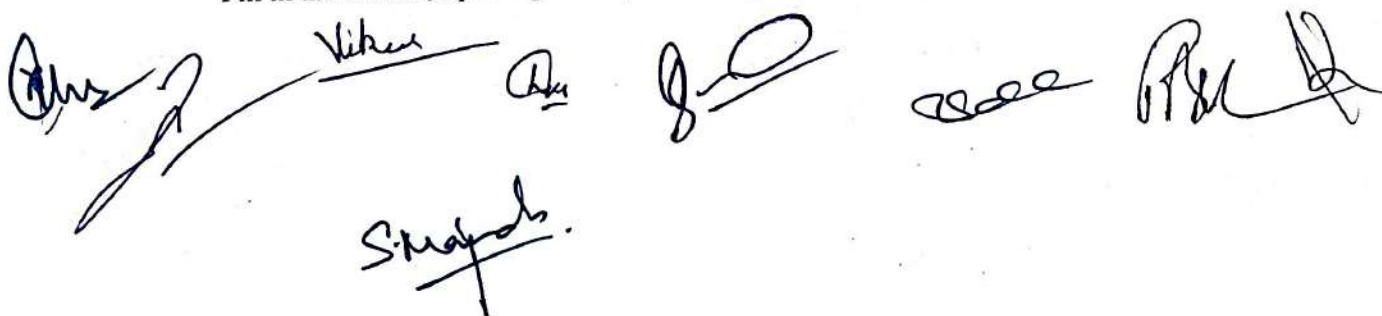
Probability, Time and Distance, Quadratic Equations, Odd one out, Races and Games, Numbers and Ages, Averages, Mensurations, Profit and Loss, Problems on Numbers, Pipes and Cisterns, Indices and Surds, Simple Equations, Permutation and Combination, Simple & Compound Interest, Boat and Streams, Simplifications and Approximations, Mixture and Allegations, LCM & HCF, Time & Work, Problems on Trains, Ratio and Proportion, Areas, Volumes and Percentage etc.
Analogies, Similarities and differences, Space Visualization, Spatial orientation, Problem-solving, Analyst, Judgment, Decision making, Visual memory, Discrimination, Observation, Relationship concepts, Arithmetical reasoning and figural classification, Arithmetical number series, Non-verbal series, coding and decoding, syllogistic reasoning, clocks, Odd one out, Symbolic/Number classification, letter series, shapes and mirrors, Venn Diagrams etc.

iii. General Awareness

Indian History, Indian Culture & Heritage, Current Events-National & International, Indian Polity, Indian Constitution, General Science & Technology, Indian Geography, IT & Space, Indian Economy etc.

iv. English

Antonyms, Synonyms, Active and Passive Voice, Substitution, Sentence Improvement, Spelling Test, Passage Completion, Idioms and Phrases, Transformation, Prepositions, Fill in the Blanks, Spotting Errors, Para completion, Joining Sentences etc.

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Subject-wise Syllabus for Store Keeper Post
Pay Level -3 of 7th CPC Pay Matrix

295

i. **Quantitative Aptitude:**

Probability, Time and Distance, Quadratic Equations, Odd one out, Races and Games, Numbers and Ages, Averages, Mensurations, Profit and Loss, Problems on Numbers, Pipes and Cisterns, Indices and Surds, Simple Equations, Permutation and Combination, Simple & Compound Interest, Boat and Streams, Simplifications and Approximations, Mixture and Allegations, LCM & HCF, Time & Work, Problems on Trains, Ratio and Proportion, Areas, Volumes and Percentage etc.

ii. **General Awareness:**

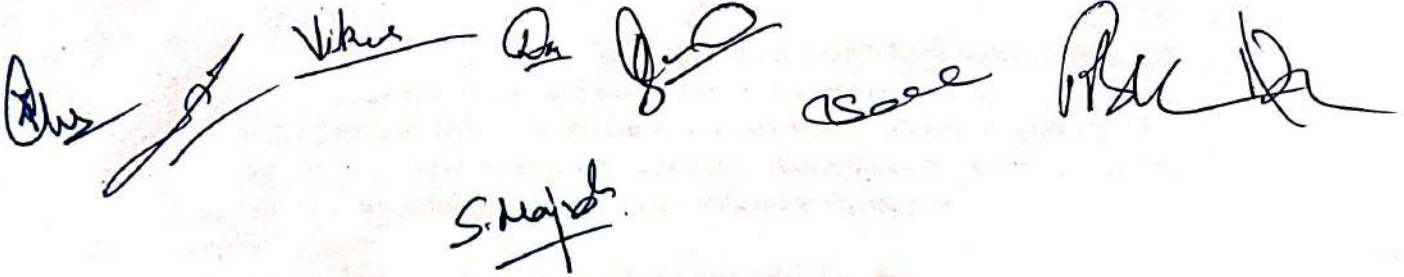
Indian History, Indian Culture & Heritage, Current Events-National & International, Indian Polity, Indian Constitution, General Science & Technology, Indian Geography, IT & Space, Indian Economy etc.

iii. **General Intelligence:**

Analogies, Similarities and differences, Space Visualization, Spatial orientation, Problem-solving, Analyst, Judgment, Decision making, Visual memory, Discrimination, Observation, Relationship concepts, Arithmetical reasoning and figural classification, Arithmetical number series, Non-verbal series, coding and decoding, syllogistic reasoning, clocks, Odd one out, Symbolic/Number classification, letter series, shapes and mirrors, Venn Diagrams etc.

iv. **English Language:**

Antonyms, Synonyms, Active and Passive Voice, Substitution, Sentence Improvement, Spelling Test, Passage Completion, Idioms and Phrases, Transformation, Prepositions, Fill in the Blanks, Spotting Errors, Para completion, Joining Sentences etc.

The bottom section of the page contains several handwritten signatures and initials. From left to right, there is a signature that appears to be 'A. S.', followed by 'Vikas', 'A.', 'J.', 'Saeed', and 'R. S.'. Below these, the name 'S. Majhi' is written and underlined.

**General Syllabus for Entry-Level post of
Category-II Technical Assistant pay level 5 of 7th CPC Pay Matrix**

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To be used against General Awareness & Reasoning, General English & General Science and Arithmetic of framework elaborated at Para 2.2 of Appendix X1 of ICFRE TSR-2013 for all functional Groups viz. Field/Lab Research, Maintenance, Workshop, General Service and Para Medical.

A. General Awareness & Reasoning (20 MCQ):

I. 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 everyday observation and experience in their scientific aspects as may be expected from an educated person. The test will also include questions relating to India and its neighbouring countries especially pertaining to history, culture, geography, economic scene, general policy and scientific research etc. These questions will be such that they do not require a special study of any discipline.

II. Reasoning:-

Questions of reasoning would include questions of both verbal and non-verbal type. This component will include questions of analogies, similarities and differences, spatial visualization, spatial orientation, problem solving, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetic reasoning, verbal and figure classification, arithmetical number series, non-verbal series, coding and decoding, statement, conclusion, syllogistic reasoning etc.

B. General English & General Science (20MCQ)

I. General English:-

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 misspelled words, idioms & phrases, One word substitution, improvement of sentences, Active/Passive Voice of Verbs, conversion into direct/indirect narration, comprehension Passage etc.

II. General Science:-

Basic understanding of science expected of a high school student

C. Arithmetic (20 MCQ)

The questions will be designed to test the ability of appropriate use of numbers and number sense of the candidate. The part will include questions on problems relating to numbers system, computation of whole numbers, decimals and fractions, relationships between numbers, fundamental arithmetical operations, percentage, ratio and proportion, average, interest, profit and loss, discount, use of tables and graphs, mensuration time and distance ratio and time etc.

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BOTANY

BIODIVERSITY

Microbes, Algae, Fungi and introduction to Archegoniate, Bryophytes, pteridophytes, Gymnosperms

PLANT ECOLOGY AND TAXONOMY

Introduction, Ecological factors, Plant communities, Ecosystem Phytogeography, Introduction to plant taxonomy, Identification, Taxonomic evidences from palynology, cytology, phytochemistry and molecular data, Taxonomic hierarchy, Botanical nomenclature, Classification, Biometrics, numerical taxonomy and cladistics

PLANT ANATOMY AND EMBRYOLOGY

Meristematic and permanent tissues, Organs, Secondary Growth, Adaptive and protective systems, Structural organization of flower, Pollination and fertilization, Embryo and endosperm, Apomixis and polyembryony

PLANT PHYSIOLOGY AND METABOLISM

Plant-water relations, Mineral nutrition, Translocation in phloem. Photosynthesis, Respiration, Enzymes, Nitrogen metabolism, Plant growth regulators, Plant response to light and temperature

CELL AND MOLECULAR BIOLOGY

Techniques in Biology (Principles of microscopy, Light Microscopy etc.), Cell as a unit of Life, Cell Organelles (Mitochondria, Chloroplast, ER, Golgi body & Lysosomes, Peroxisomes and Glyoxisomes, Nucleus), Cell Membrane and Cell Wall, Cell Cycle, Genetic Material (DNA, DNA replication (Prokaryotes and Eukaryotes), Transcription (Prokaryotes and Eukaryotes), Regulation of gene expression

ECONOMIC BOTANY AND BIOTECHNOLOGY

Origin of Cultivated Plants, Cereals, Legumes, Spices, Beverages, Oils and Fats, Fibre Yielding Plants, Introduction to Biotechnology, Plant tissue culture, Recombinant DNA Techniques

GENETICS AND PLANT BREEDING

Heredity (Brief life history of Mendel, terminologies, laws of inheritance etc.), Sex-determination and Sex-Linked Inheritance Linkage and Crossing over, Mutations and Chromosomal Aberrations, Plant Breeding, Methods of crop improvement, Quantitative inheritance, Inbreeding depression and heterosis, Crop improvement and breeding

ANALYTICAL TECHNIQUES IN PLANT SCIENCES

Imaging and related techniques (principles of microscopy, light microscopy, fluorescence microscopy etc.), Cell fractionation, Radioisotopes, Spectrophotometry, Chromatography, Characterization of proteins and nucleic acids, Biostatistics

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BIOINFORMATICS
Introduction to Bioinformatics, Databases in Bioinformatics, Biological Sequence Databases,
Sequence Alignments, Molecular Phylogeny, Applications of Bioinformatics

RESEARCH METHODOLOGY
Basic concepts of research, General laboratory practices, Data collection and documentation
of observations, Overview of biological problems, methods to study plant cell/tissue structure,
plant microtechniques, the art of scientific writing and its presentation

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A collection of very faint, light-colored handwritten notes and scribbles at the bottom of the page, which are difficult to decipher.

Subject-wise Syllabus for Technical Assistant (Field/Lab)-Biological Science Post
Pay Level -5 of 7th CPC Pay Matrix

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ZOOLOGY

ANIMAL DIVERSITY

Kingdom Protista, Phylum Porifera, Phylum Cnidaria, Phylum Platyhelminthes, Phylum Nematelminthes, Phylum Annelida, Phylum Arthropoda, Phylum Mollusca, Phylum Echinodermata, Protochordates, Agnatha, Pisces, Amphibia, Reptiles, Aves, Mammals

COMPARATIVE ANATOMY AND DEVELOPMENTAL BIOLOGY OF VERTEBRATES

Integumentary System (derivatives of integument w.r.t. glands and digital tips), Skeletal System (evolution of visceral arches), Digestive System (brief account of alimentary canal and digestive glands), Respiratory System (gills, lungs, air sacs and swim bladder), Circulatory System (evolution of heart and aortic arches), Urinogenital System (Succession of kidney, Evolution of urino-genital ducts), Nervous System (comparative account of brain), Sense Organs (Types of receptors), Early Embryonic Development (Gametogenesis, fertilization etc), Late Embryonic Development (implantation of embryo in humans, formation of human placenta and functions etc), Control of Development (Fundamental processes in development-gene activation, determination etc.)

PHYSIOLOGY AND BIOCHEMISTRY

Nerve and muscle, Digestion, Respiration, Excretion, Cardiovascular system, Reproduction and Endocrine Glands, Carbohydrate Metabolism, Lipid Metabolism, Protein metabolism, enzymes

GENETICS AND EVOLUTIONARY BIOLOGY

Introduction to Genetics, Mendelian Genetics and its Extension, Linkage, Crossing over and Chromosomal Mapping, Mutations, Sex Determination, History of Life, Introduction to Evolutionary Theories, Direct Evidences of Evolution, Processes of Evolutionary Change, Species concept, Macro evolution, Extinction

ANIMAL BIOTECHNOLOGY

Introduction (concept and scope of biotechnology), Molecular Techniques in Gene manipulation (cloning vectors, restriction enzymes, transformation techniques etc.), Genetically Modified Organisms (production of cloned and transgenic animals, applications of transgenic animals, production of transgenic plants, applications of transgenic plants), Culture Techniques and Applications

APPLIED ZOOLOGY

Introduction to Host-Parasite Relationship, Epidemiology of Diseases, Rickettsiae and Spirochaetes, Parasitic Protozoa, Parasitic Helminthes, Insects of Economic Importance, Insects of Medical Importance, Animal Husbandry, Poultry Farming, Fish Technology

AQUATIC BIOLOGY

Aquatic Biomes (brief introduction of the aquatic biomes etc.), Freshwater Biology (Lakes: origin and classification etc, Streams: Different stages of stream development etc.), Marine

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Biology (salinity and density of sea water etc.), management of Aquatic Resources (causes of pollution, Water quality assessment-BOD and COD etc.)

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IMMUNOLOGY

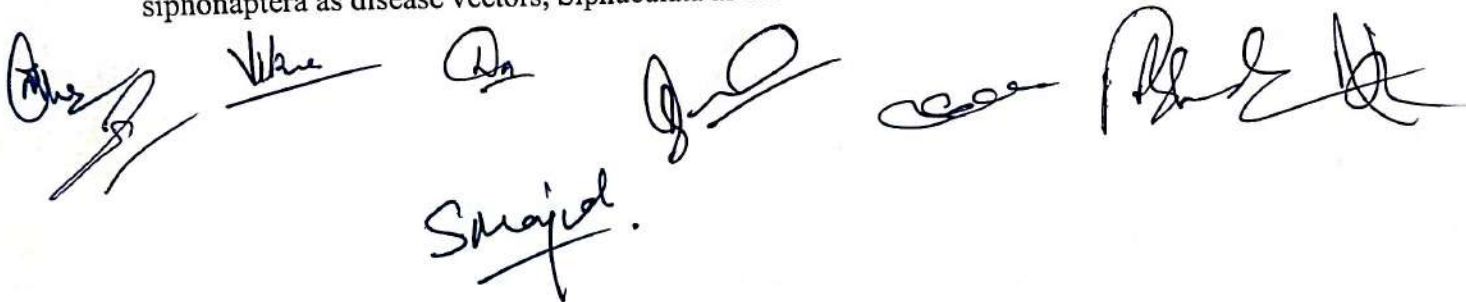
Overview of the Immune System, Cells and Organs of the Immune System, Antigens, antibodies, Working of the immune system, Immune system in health and disease, vaccines.

REPRODUCTIVE BIOLOGY

Reproductive endocrinology (gonadal hormones and mechanism of hormone action, steroids etc.), Functional anatomy of male reproduction (outline and histological of male reproductive system in rat and human, testis, germcell etc.), Functional anatomy of female reproduction (outline and histological of female reproductive system in rat and human, ovary, ovulation etc.), Reproductive Health (Infertility in male and female, Assisted reproductive technology, etc.)

INSECT, VECTORS AND DISEASES

Introduction to Insects, concept of vectors, Insects as vectors, dipteran as disease vectors, siphonaptera as disease vectors, Siphunculata as disease vectors, hemiptera as disease vectors

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Subject-wise Syllabus for Technical Assistant (Field/Lab)-Biological Science Post
Pay Level -5 of 7th CPC Pay Matrix

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Syllabus of Forestry

SILVICULTURE

General Silvicultural Principles -Ecological and physiological factors influencing vegetation, natural and artificial regeneration of forests; methods of propagation, grafting techniques; site factors; nursery and planting techniques nursery beds, containers and maintenance, grading and hardening of seedlings; establishment and tending. Silviculture of some of the economically important species in India. Silviculture systems (Clear felling, uniform shelter wood selection, coppice and conversion systems), Management of silviculture systems of temperate, subtropical, humid tropical, dry tropical and coastal tropical forests; Thinning.

AGROFORESTRY

Agroforestry- Scope and necessity; Agro forestry systems under different agroecological zones; selection of species and role of multipurpose trees and NTFP's, techniques, food, fodder and fuel security. Social/Urban Forestry: Objectives, scope and necessity. JFM-Principles, objectives, Methodology, scope and benefits, National agroforestry policy.

FOREST SOILS AND WATERSHED MANAGEMENT

Forests Soils: Classification, factors affecting soil formation; physical, chemical and biological properties. Soil conservation-definition, causes for erosion; types-wind and water erosion; conservation and management of eroded soils/areas, wind breaks, shelter belts; sand dunes; water logged and other waste lands. Role of forests in conserving soils. Role of micro-organisms in ameliorating soils; N and C cycles. Watershed Management-Concepts of water shed; forest hydrology, landslide controls, rehabilitation of degraded areas; water harvesting and conservation; ground water recharge and watershed management.

ENVIRONMENTAL CONSERVATION AND BIODIVERSITY

Environment- Components and importance, principles of conservation, impact of deforestation, forest fires and various human activities like mining, construction and developmental projects, population growth on environment. Pollution-Types, Global warming, green house effects, ozone layer depletion, acid rain, impact and control measures, environmental monitoring; concept of sustainable development. Control and prevention of air, water and noise pollution. Environmental impact Assessment.

TREE IMPROVEMENT

General concept of tree improvement, methods and techniques, variation and its use, provenance, seed source, exotics; quantitative aspects of forest tree improvement, seed production and seed orchards, progeny tests, use of tree improvement in natural forest and stand improvement, forest genetic resources and gene conservation in situ and ex-situ, application of DNA technology in forestry.

FOREST MANAGEMENT AND MENSURATION

Objective and principles; techniques; stand structure and dynamics, sustained yield relation; rotation, normal forest, growing stock; regulation of yield; management of forest plantations,

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commercial forests, forest cover monitoring. Forest Divisional Working plans. Methods of measuring -diameter, girth, height and volume of trees; form-factor; volume estimation of stand, current annual increment, mean annual increment, Sampling methods and sample plots. Yield calculation; yield and stand tables, forest cover monitoring through remote sensing; Geographic information Systems for management and modeling. Forest Surveying different methods of surveying.

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FOREST ECOLOGY

Biotic and abiotic components, forest eco-systems; forest community concepts; vegetation concepts, ecological succession and climax, primary productivity, nutrient cycling and water relations. Forest types in India, identification of species. composition and associations; dendrology, taxonomic classification, principles and establishment of herbaria and arboreta conservation of forest ecosystems.

FOREST RESOURCES AND UTILIZATION

Logging and extraction techniques and principles, transportation systems, storage and sale of Timber, Non-Timber Forest Products (NTFPs) definition and scope; gums, resins, oleoresins, fibres, oil seeds nuts, rubbers, canes, bamboos, medicinal plants, charcoal, lac and shellac, katha and Bidi leaves, need and importance of wood seasoning and preservation general principles of seasoning, air and kiln seasoning, composite wood; plywood, fibre boards, particle boards, wood substitution.

FOREST PROTECTION & WILDLIFE

Injuries to forest, insect-pests and disease, General forest protection against fire, equipment and methods, controlled use of fire. Rotational and controlled grazing, different methods of control against grazing and browsing animals; effect of wild animals on forest regeneration; encroachment, poaching, shifting cultivation and control.

FOREST ECONOMICS AND LEGISLATION

Fundamental principles, cost-benefit analyses; estimation of demand and supply: Socioeconomic analysis of forest productivity and attitudes; valuation of forest goods and service. National Forest Policy, Forest laws, necessity; general principles, Indian Forest Act 1927, Forest Conservation Act, 1980, Wildlife Protection Act 1972 and their amendments.

FORESTS AND PEOPLE

Forests and its importance, forest societies, interactions with people, social and cultural factors, afforestation programmes, forest conflicts, wildlife and human conflicts, important forest movements, gender dimension, tribal economy, pastoralists, management of commons and Common Property Resources (CRPS) and open access resources, sustainable livelihood, food security, eco-tourism, land use change. Forest rights, customary rights of people, community participation, biodiversity and ethnobotany, global environmental change and land use, resettlement, poverty alleviation and forests, role of NGOs and other CBOs community based organizations.

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