

Syllabi and difficulty-level of Questions

For Written-Tests for the various Non-Teaching posts

1. Senior Technical Assistant (STA)

For STA in Computer Science and Engineering (CSE)/ Information Technology (IT) Department:

(a) Syllabus:

Digital Electronics: Boolean algebra. Number representations and computer arithmetic (fixed and floating point). Combinational logic circuits, minimization of Boolean functions. IC families: TTL and CMOS. Arithmetic circuits, comparators, Schmitt trigger, multi-vibrators, sequential circuits, flip flops, shift registers, timers and counters; sample-and-hold circuit, multiplexer, analog-to-digital (successive approximation, integrating, flash and sigma-delta) and digital-to-analog converters (weighted R, R-2R ladder and current steering logic). Characteristics of ADC and DAC (resolution, quantization, significant bits, conversion/settling time); basics of number systems.

Computer Organization and Architecture: Machine instructions and addressing modes. ALU, data-path and control unit. Instruction pipelining, pipeline hazards. Memory hierarchy: cache, main memory and secondary storage; I/O interface (interrupt and DMA mode).

Embedded Systems, Microprocessors and Micro-controllers: Embedded Systems: Microprocessor and microcontroller applications, memory and input output interfacing

Programming and Data Structures: Programming in C, Recursion. Arrays, stacks, queues, linked lists, trees, binary search trees, binary heaps, graphs.

Algorithms: Searching, sorting, hashing. Asymptotic worst case time and space complexity. Algorithm design techniques: greedy, dynamic programming and divideandconquer. Graph traversals, minimum spanning trees, shortest paths; Theory of Computation, Regular expressions and finite automata. Context-free grammars and push-down automata. Regular and contextfree languages, pumping lemma. Turing machines and undecidability.

Compiler Design: Lexical analysis, parsing, syntax-directed translation. Runtime environments. Intermediate code generation. Local optimisation, Data flow analyses: constant propagation, liveness analysis, common subexpression elimination.

Operating Systems: System calls, processes, threads, interprocess communication, concurrency and synchronization. Deadlock. CPU and I/O scheduling. Memory management and virtual memory. File systems.

Databases: ER-model. Relational model: relational algebra, tuple calculus, SQL. Integrity constraints, normal forms. File organization, indexing (e.g., B and B+ trees). Transactions and concurrency control.

Computer Networks: Concept of layering: OSI and TCP/IP Protocol Stacks; Basics of packet, circuit and virtual circuit-switching; Data link layer: framing, error detection, Medium Access Control, Ethernet bridging; Routing protocols: shortest path, flooding, distance vector and link state routing; Fragmentation and IP addressing, IPv4, CIDR notation, Basics of IP support protocols (ARP, DHCP, ICMP), Network Address Translation (NAT); Transport layer: flow control and congestion control, UDP, TCP, sockets; Application layer protocols: DNS, SMTP, HTTP, FTP, Email.

Quantitative Ability, Reasoning and Intelligence:

The questions in this component would be designed to test the quantitative ability, reasoning and intelligence and general knowledge of the candidates. **Quantitative ability:** 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.

Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Level of questions to be of BE/B.Tech. degree level examinations.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligence will be 20-25%

For STA in Civil Engineering(CE) Department:

(a) Syllabus:

Structural Engineering: Engineering Mechanics: System of forces, free-body diagrams, equilibrium equations; Internal forces in structures; Frictions and its applications; Centre of mass; Free Vibrations of undamped SDOF system. Solid Mechanics: Bending moment and shear force in statically determinate beams; Simple stress and strain relationships; Simple bending theory, flexural and shear stresses, shear centre; Uniform torsion, Transformation of stress; buckling of column, combined and direct bending stresses. Structural Analysis: Statically determinate and indeterminate structures by force/ energy methods; Method of superposition; Analysis of trusses, arches, beams, cables and frames; Displacement methods: Slope deflection and moment distribution methods; Influence lines; Stiffness and flexibility methods of structural analysis.

Construction Materials and Management: Construction Materials: Structural Steel-Composition, material properties and behaviour; Concrete - Constituents, mix design, short-term and long-term properties.

Construction Management: Types of construction projects; Project planning and network analysis- PERT and CPM; Cost estimation.

Concrete Structures: Working stress and Limit state design concepts; Design of beams, slabs, columns; Bond and development length; Pre-stressed concrete beams. **Steel Structures:** Working stress and Limit state design concepts; Design of tension and compression members, beams and beam- columns, column bases; Connections- simple and eccentric, beam-column connections, plate girders and trusses; Concept of plastic analysis - beams and frames.

Geotechnical Engineering: Soil Mechanics; Three-phase system and phase relationships, index properties; Unified and Indian standard soil classification system; Permeability - one dimensional flow, Seepage through soils – two - dimensional flow, flow nets, uplift pressure, piping, capillarity, seepage force; Principle of effective stress and quicksand condition; Compaction of soils; Onedimensional consolidation, time rate of consolidation; Shear Strength, Mohr's circle, effective and total shear strength parameters, Stress-Strain characteristics of clays and sand; Stress paths.

Foundation Engineering: Sub-surface investigations - Drilling bore holes, sampling, plate load test, standard penetration and cone penetration tests; Earth pressure theories - Rankine and Coulomb; Stability of slopes – Finite and infinite slopes, Bishop's method; Stress distribution in soils – Boussinesq's theory; Pressure bulbs, Shallow foundations – Terzaghi's and Meyerhoff's bearing capacity theories, effect of water table; Combined footing and raft foundation; Contact pressure; Settlement analysis in sands and clays; Deep foundations – dynamic and static formulae, Axial load capacity of piles in sands and clays, pile load test, pile under lateral loading, pile group efficiency, negative skin friction.

Water Resources Engineering: Fluid Mechanics: Properties of fluids, fluid statics; Continuity, momentum and energy equations and their applications; Potential flow, Laminar and turbulent flow; Flow in pipes, pipe networks; Concept of boundary layer and its growth; Concept of lift and drag. Hydraulics: Forces on immersed bodies; Flow measurement in channels and pipes; Dimensional analysis and hydraulic similitude; Channel Hydraulics - Energy-depth relationships, specific energy, critical flow, hydraulic jump, uniform flow, gradually varied flow and water surface profiles. Hydrology: Hydrologic cycle, precipitation, evaporation, evapo-transpiration, watershed, infiltration, unit hydrographs, hydrograph analysis, reservoir capacity, flood estimation and routing, surface run-off models, ground water hydrology - steady state well hydraulics and aquifers; Application of Darcy's Law. Irrigation: Types of irrigation systems and methods; Crop water requirements - Duty, delta, evapo-transpiration; Gravity Dams and Spillways; Lined and unlined canals, Design of weirs on permeable foundation; cross drainage structures.

Environmental Engineering: Water and Waste Water Quality and Treatment: Basics of water quality standards – Physical, chemical and biological parameters; Water quality index; Unit processes and operations; Water requirement; Water distribution system; Drinking water treatment. Sewerage system design, quantity of domestic wastewater, primary and secondary treatment. Effluent discharge standards; Sludge disposal; Reuse of treated sewage for different

applications. Air Pollution: Types of pollutants, their sources and impacts, air pollution control, air quality standards, Air quality Index and limits. Municipal Solid Wastes: Characteristics, generation, collection and transportation of solid wastes, engineered systems for solid waste management (reuse/recycle, energy recovery, treatment and disposal).

Transportation Engineering: Transportation Infrastructure: Geometric design of highways - cross-sectional elements, sight distances, horizontal and vertical alignments. Geometric design of railway Track – Speed and Cant. Concept of airport runway length, calculations and corrections; taxiway and exit taxiway design. Highway Pavements: Highway materials - desirable properties and tests; Desirable properties of bituminous paving mixes; Design factors for flexible and rigid pavements; Design of flexible and rigid pavement using IRC codes Traffic Engineering: Traffic studies on flow and speed, peak hour factor, accident study, statistical analysis of traffic data; Microscopic and macroscopic parameters of traffic flow, fundamental relationships; Traffic signs; Signal design by Webster's method; Types of intersections; Highway capacity.

Geomatics Engineering: Principles of surveying; Errors and their adjustment; Maps - scale, coordinate system; Distance and angle measurement - Levelling and trigonometric levelling; Traversing and triangulation survey; Total station; Horizontal and vertical curves. Photogrammetry and Remote Sensing - Scale, flying height; Basics of remote sensing and GIS.

Basics of Computers and their applications: History of Computers; Basics of Hardware and Software; Input /Output Devices; Number System; Windows Operating System Basics; Basic Internet Knowledge and Protocol; Basic Functionalities of MS-Office (MS-Word, MS-Excel, MS-Power Point); Networking and Communication; Database Basics; Memory and Storage Devices; Computer Shortcuts Key; Computer Abbreviation. Computer applications and use of the various software used in Civil Engineering.

Quantitative Ability, Reasoning and Intelligence:

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Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) **Difficulty level: Level of questions to be of BE/B.Tech. degree level examinations.**

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

2. Junior Programmer

(a) Syllabus:

Database Management System: Database management systems, DBMS Structure and components, data models and properties, relational algebra, database design and ER modelling, normalization, ACID and Database transactions, comparisons and case study of versions DBMS like oracle MySql, SqlServer, PostGre

SQL PL SQL Complete SQL, SQL fundamentals, All Clauses and Statements, Grouping and nested queries, all Boolean operators and statements with where clause, Pattern matching Date operations all aggregate functions, all types of Joins and all set operations, PISql and programme structure and syntaxes, PISql cursors, cursor types and uses, conditional and control structures.

Software Engineering Software Product and process Characteristics Software Process Models Linear Sequential Model, Prototyping Model, RAD Model, Evolutionary Process Models like Incremental Model, Spiral Model, Components Assembly Models, RUP and Agile Development methods-scrum, XP, Kanban, Process customization and improvement, CMM, Product and process metrics; Functional and non-functional requirements, Requirement Sources and Elicitation Techniques Analysis Modelling for function-oriented and Object-Oriented software development, Use case Modelling, System and software requirement specifications, requirement Validation Traceability; Software Static and Dynamic, analysis Code inspections, Software testing Fundamentals, Software Test process, Testing levels, test criteria, Test case Design, Test Oracles, Test Techniques, Black Box Testing, White-Box Unit Testing and Unit Testing Frameworks, Integration Testing, System Testing and other Specialized Testing, Test Plan, Test Metrics, Testing Tools.

Data Structure Abstract data types, Array, stacks, queues, linked lists, trees, binary search trees, binary heaps, AVL trees, Search trees, graphs, Types of graph, Representation of graph in memory, application, Introduction to algorithms, Searching, Sorting, Algorithms analysis, best, average and worst case analysis. Asymptotic complexity, asymptotic notation, Algorithm design using divide-and-conquer, and greedy approach.

Computer Networks Concept of layering. LAN technologies (Ethernet). Flow and error control techniques, switching. IPv4/IPv6, routers and routing algorithms (distance vector, link state). TCP/UDP and sockets, congestion control. Application layer protocols (DNS, SMTP, POP, FTP, HTTP). Basics of Wi-Fi. Network security: authentication, basics of public key and private key cryptography, digital signatures and certificates, firewalls.

Programming

A. Programming in Python Language

Class & Objects, Data Types and Collection Data Types: Identifiers and keyword, Integral types floating point types, operations and formatting, Sequence types, Tuples, named Tuples, lists, set Types, sets, frozen sets, mapping types, Dictionaries, Iterating and Copying collections iterators and intractable operations and functions copying collection.

Central Structures and Functions: Conditional branching, looping, Exception handling catching and raising exceptions, custom exceptions custom functions, Names and Docstrings, Argument and Parameter unpacking, Accessing variables in Global scope, lambda functions.

Modules and Packages: Packages, custom modules, overview of python's standard library, string handling, mathematics and Numbers, Times and dates, File formats, Data persistence. File Handling: Writing and Reading binary data, raw binary data, compression, parsing text files, Random Access binary files, generic binary record file class.

Python Classes and objects: User-Defined Classes, Encapsulation, Data hiding, Class Variables and Instance Variables, Instance methods, Class method, static methods, constructor in python, parametrized constructor, Magic Methods in python, Object as an argument, Instances as Return Values, namespaces.

Functional Programming: Map, filter, Reduce, Comprehensions, Immutability, Closures and Decorators, generators, Co-routines, iterators, Declarative programming.

GUI Programming Ipywidgets Package, Numeric Widgets, Boolean Widgets, Selection Widgets, String Widgets, Date Picker, Color Picker, Container Widgets, Creating a GUI Application, Tkinter, button, canvas, Libraries in Python.

B. Programming in Java

Core Java Fundamentals: Introduction to Java Language, Java IDE, Simple Java Program, Constants, variables, data types. Declaration of variables, Scope of variables, arrays, Typecasting, Operators, Expressions, Control statements- Decision making & branching, Decision making & looping. Class, Object, Object reference, Constructor, Constructor Overloading, Method Overloading, Recursion, Passing and Returning object form Method, new operator, this and static keyword, finalize() method, Access control, modifiers, Nested class, Inner class, Anonymous inner class, Abstract class.

Arrays and Strings: Creating & Using Arrays (One Dimension and Multi-dimensional), Java Strings: The Java String class, Manipulating Strings, String Immutability & Equality, Passing Strings Methods, String Buffer Classes. Simple I/O using System.out and the Scanner class, Byte and Character streams, Reading/Writing from console and files, Handling String using Methods

Inheritance, Threads and Interfaces : Inheritance, Single, Multiple, Multilevel, Hybrid, Constructors in derived class, Method overriding, Using Abstract classes, using final with inheritance, Packages, importing packages, Interfaces: Define, implement and extend. Default interface methods, Use static method in interface.

Multithreading, Exception Handling and Database Connectivity: Multithreading: Introduction, creating thread and extending thread class. Exception handling: Introduction, Types of errors, Exception handling syntax, Multiple catch statements. Try and catch block. Console I/O and File I/O, Database Connectivity using JDBC.

C. Programming in C

The Structure of C program-Data Types, Variables, Constants- Operands, Operators, Arithmetic Operators, Logical and Relational Operators, Bitwise operators, Expression-Input/Output Management- The getchar() and Purchar() Functions-Single-Character I/O-String I/O-Formatted Input and Output Function.; Introduction-go to statement- If-else statement-nested if-else statement-switch statement- for loop-nested for loop-while loop-do-while loop-break statement-continue statement-exit() function, Function; Introduction-call by value and call by Reference-return values-recursion-Arrays-introduction to Arrays-Initialization of Array-Multi dimensional, Pointers and array:- pointers-Introduction-definition-address operator-pointer variables-pointers to pointers-pointers and arrays:- pointers and functions-Files-Introduction-File Structure-File handling functions-File Types-Error handling-Structure-Introduction-declaring-initialization.

Quantitative Ability, Reasoning and Intelligence:

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Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics..

(b) Difficulty level:Level of questions to be of BE/B.Tech. degree level examinations.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

3. Library Assistant

(A) Syllabus:

a). Librarianship Basics

Library and Society: Law of Library Science, Types of Libraries, Library Associations, systems and programmes, Library Movement and Library Legislation in India; Organizations and Institutions involved in the development of Library and Information Services-UNESCO, IFLA, FID INIS, NISSAT.

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, Encyclopedias, Ready Reference Source etc.

Sources of Information-Primary, Secondary, Tertiary, Documentary, Non-Documentary, E-Documents, E-Books, E-Journals, 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.

b). Basic knowledge of Computer and its Application in Library and Information Activities

Introduction to Computers: Computers: Generations, Types, Input and Output Devices, Computer Architecture, Data Representation and Storage, Introduction to System Software and Application Software, Operating Systems: Window XP, Vista, Windows NT, Linux, etc. Word Processing, Spreadsheets, PowerPoint Presentation Graphics Software: Basic Functions and Potential Uses Communication Software.

Library Automation: Library Automation: Planning and Implementation In-house Operations: Acquisition, Cataloguing, Circulation, Serial Control, OPAC, etc. Bibliographic Standards: CCF and MARC 21 Introduction to Metadata: Types of Metadata Dublin Core, Library Software Packages: Overview and House Keeping Operations.

Database Creation and Library Software: Installation and Creation of Databases: Import, Export, Hyperlinks and Printing of Records using WINISIS, Alice for Windows: Installation, Configuration and Functions, Installation, Configuration and Application of SOUL

Database Web Interface: GENISIS: Installation, Configuration and Functions, Web Interface to WINISIS using GENISIS23 24.

Online and Offline Searching: Web Searching, Advanced Internet Searching, Search through Meta Search Engines, Offline Databases, Internet and E-mail.

Library Automation: Library Automation: Planning and Implementation, In-house Operations: Acquisition, Cataloguing, Circulation, Serial Control, OPAC, etc. Bibliographic Standards: CCF and MARC 21 Introduction to Metadata: Types of Metadata Dublin Core, Library Software Packages: Overview and House Keeping Operations Internet and E-mail.

Information Sources and Services: Fundamental Concepts: Meaning, Definition, Importance, Nature and Characteristics, Printed and Electronic Information Sources, Types of Information Sources and Services, Criteria for Evaluation of Reference Sources.

Sources of Information: Primary Information Sources: General introduction (Periodicals, Conferences, Patents, Standards, Thesis/ Dissertations, Trade Literature etc.), Secondary Information Sources: Dictionaries, Encyclopaedias, Biographical, Geographical, Bibliographies, Indexing and Abstracting, Newspaper Indexes and Digests, Statistics, Handbooks and Manuals, Tertiary Information Sources: Directories, Year books, Almanacs, Bibliography of Bibliographies, Union Catalogues.

Reference and Information Services: Users and their Information Needs, Theory and Functions of Reference and Information Service, Enquiry Techniques.

Types of Information Services: Documentation Services: Abstracting and Indexing Services, Alerting Services, CAS, SDI, Reprographic Service, Translation Service, Document Delivery and Referral Service.

Quantitative Ability, Reasoning and Intelligence:

The questions in this component would be designed to test the quantitative ability, reasoning and intelligence and general knowledge of the candidates. **Quantitative ability:** 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.

Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Level of questions to be of B.Lib. degree level examination.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

4. Technical Assistant

The candidate has to appear in the written test of the Department in which he/she has applied.

(a) Syllabus:

(i) Electrical Engineering Department: Electrical circuits, Electrical Measurements and Measuring Instruments, Transmission, Electrical machines, distribution and utilization of electrical power, Electronic devices, circuits and their applications, Control systems, Digital electronics, microprocessors and microcontrollers, Power electronics and drives, Instrumentation, Industrial electronics and Control of drives, Power system protection; Repair and maintenance of Electrical equipments, Computer applications and use of various software used in Electrical Engineering Education.

(ii) Electronics and Communication Engineering Department: Electronic devices and circuits, Electrical circuits and measurements, Industrial electronics, Digital electronics, Linear Integrated circuits, analog and digital communication, digital electronics, Computer technology, Microprocessors and microcontrollers, VLSI and embedded systems, computer hardware, networking, Microwave engineering, Computer applications and use of various software used in Electronics and Communication Engineering Education.

(iii) Computer Science and Engineering/Information Technology Department: Basic concepts of Electrical and Electronics Engineering, Digital electronics, Data structures, Computer programming languages, Computer organization, Operating systems, Data base management, Microprocessors and microcontrollers, Analog and digital communication, Software engineering, Computer networks, Computer graphics, Web designing, Network security and management, Mobile computing, Multimedia and applications, software testing.

(iv) Mechanical Engineering Department: Basics of Electrical and Electronics Engineering, Basics of computer technology, Workshop Technology, Engineering materials, Applied mechanics, Metrology and instrumentation, Hydraulics and Pneumatics, Strength of materials, Thermodynamics, Refrigeration and air conditioning, theory of machines, Computer graphics, Production management, Machine design, Automobile engineering, CNC machines and automation, Computer applications and use of various software used in Mechanical Engineering Education.

(v) Civil Engineering Department: Engineering Drawing and Graphics, Surveying, Applied Mechanics, Hydraulics, Basic concepts of Electrical and Mechanical Engineering, Building materials, Modern Construction materials, Concrete Technology, Design of RCC structures, Theory of structures, Design of steel structures, Contract and specification in Construction, Soil Mechanics and Foundation Engineering, Building Services, Construction Engineering and Management, Construction Economy and Finance, Construction Project Management, Building

Acoustics and Noise Control, Quality and Safety management, Environmental Engineering, Maintenance and rehabilitation of Constructed facilities, Transportation Engineering, Application of CAD in Civil Engineering Practice.

Quantitative Ability, Reasoning and Intelligence:

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Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Questions of the level of three year Diploma examination.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligence will be 20-25%

II. Biological Sciences and Engineering Department:

(a) Syllabus

Microbiology, Biochemistry, Cell Biology, Molecular Biology, Recombinant DNA Technology, Immunology, Bioinformatics, Bioprocess Engineering principles, Plant and Animal tissue culture, Basics techniques like spectrophotometer, centrifugation, PCR, Chromatography etc. Computer applications and use of various software used in Bio-Sciences and Engineering Education.

Quantitative Ability, Reasoning and Intelligence:

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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.

Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty Level: Questions of the level of three year B. Sc. Degree examination

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

III. Chemistry Department:

(a) Syllabus

Inorganic Chemistry: Atomic Structure, Periodic Properties, Redox Reactions-I, Chemical Bonding, Ionic solids, S & P block elements, Metallurgical processes, First, Second and Third Transition Series, Acids and Bases, Coordination Chemistry, Paint industry Redox Reactions Chemistry of Lanthanides & Actinides, Non Aqueous Solvents, Corrosion of metal Thermodynamic and Kinetic Aspects of Coordination Compounds, Metal-Ligand Bonding in transition Metal Complexes, Magnetic Properties of Transition Metal Complexes, Electronic Spectra of Transition Metal Complexes, Electro-analytical Techniques Hard and Soft Acid-Base Theory, Organometallic chemistry, Bioinorganic Chemistry, Inorganic Polymers of Silicon and Phosphorus, Industrially Important Inorganic Materials.

Organic Chemistry: Structure and Bonding, Mechanism of Organic Reactions, Stereochemistry of Organic Compounds, Alkanes; Cycloalkanes Dienes and Alkynes, Arenes and Aromaticity: Nomenclature, Alkyl and Aryl Halides, Electromagnetic Spectrum: Absorption Spectroscopy, Alcohols; Phenols, Ethers and Epoxides, Aldehydes and Ketones Carboxylic Acids, Carboxylic acid derivatives, Nitrogen Containing Organic Compounds, Organic Synthesis via Enolates Spectroscopy. Organo-Metallic Compounds, Organo-Sulphur Compounds, Heterocyclic Compounds, Carbohydrates Amino Acids, Peptides, Proteins and Nucleic Acids, Fats, Oils and Detergents, Synthetic Polymers, Synthetic Dyes, Natural Products.

Physical Chemistry: Solid State, Liquid State, Gaseous State, Colloidal State, Chemical Kinetics and Catalysis, Thermodynamics; Chemical Equilibrium, Phase Equilibrium Electrochemistry, Elementary Quantum Mechanics, Spectroscopy, Energy and Distribution Law, Photochemistry, Physical Properties and Molecular Structure, .Solutions and Colligative Properties.

Computer applications and use of various software used in Chemistry Education.

Quantitative Ability, Reasoning and Intelligence:

The questions in this component would be designed to test the quantitative ability, reasoning and intelligence and general knowledge of the candidates. **Quantitative ability:** 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.

Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Questions to be of the level of B.Sc degree examination.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

IV. Physics Department

(a) Syllabus:

Vectors, Gravitation, Conservation of Energy, Conservation of Linear & Angular Momentum, Electric Field & Potential, Electric Fields in Matter, Electric Currents, Simple Harmonic Motion (SHM), Damped Harmonic Oscillations, Forced Harmonic Oscillations, Applications, Dynamics of rigid body & Moment of Inertia, Moment of Inertia, Elasticity, Viscosity & Surface Tension, Magnetostatics, Magnetic field in matter, Alternating Currents, Electromagnetic Induction, Analysis of wave motion, Ultrasonics, Acoustics, Basic Concepts and First law of thermodynamics, Second law of Thermodynamics, Entropy, Applications of Thermodynamics, Fermat's Principle and refraction, Image Theory for Lens systems, Optical Aberrations and dispersion, Associated Optical Instruments, Crystal Structure, Diffraction, Lattice Vibration & thermal Properties of Solids, Band theory of Solids, Conduction and Convection, Kinetic Theory of Gases, Thermal Radiation, Low Temperature, Interference, Diffraction, Polarization, Associated Optical Instruments, Basic Concepts, Ensembles and Thermodynamic Connections, Classical Statistics, Quantum Statistics (BES & FDS, Origin of Quantum theory, Wave-Particle Duality, Formalism of Quantum mechanics, Schrödinger equation, Atomic Models, Optical Spectra and X-rays, Theory of Lasers, Molecular Spectroscopy Network Theorems, Power Supplies, Solid State Devices, Amplifiers, Foundation of Special theory of Relativity, Consequences of Lorentz Transformations, Electromagnetic waves, Relativity of

Electromagnetism, Elements of Nucleus, Radioactivity, Elementary Particles, Nuclear Devices, Feedback Amplifier, Oscillators, Boolean algebra, Logic Gates.

Computer applications and use of various software used in Physics Education.

Quantitative Ability, Reasoning and Intelligence:

The questions in this component would be designed to test the quantitative ability, reasoning and intelligence and general knowledge of the candidates. **Quantitative ability:** 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.

Reasoning & Intelligence: 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Questions to be of the level of B.Sc degree examination.

Note: Weightage for subject domain knowledge will be 75-80%

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

5. Junior Mechanic

(a) Syllabus:

(i) Instrumentation and Control Engineering Department: Circuit Theory, Electrical Measurements and Measuring Instruments, Transmission, Electrical machines, distribution and utilization of electrical power, Electronic devices, circuits and their applications, Control systems, Digital electronics, microprocessors and microcontrollers, Power electronics and drives, Instrumentation, Industrial electronics and Control of drives, Power system protection; Repair and maintenance of Electrical equipments, Computer applications and use of various software used in Instrumentation and Control Engineering Education.

(ii) Electronics and Communication Engineering Department: Electronic devices and circuits, Electrical circuits and measurements, Industrial electronics, Digital electronics, Linear Integrated circuits, analog and digital communication, digital electronics, Computer technology, Microprocessors and microcontrollers, VLSI and embedded systems, computer hardware, networking, Microwave engineering, Computer applications and use of various software used in Electronics and Communication Engineering Education.

(iii) Computer Science and Engineering/Information Technology Department: Basic concepts of Electrical and Electronics Engineering, Digital electronics, Data structures, Computer programming languages, Computer organization, Operating systems, Data base management, Microprocessors and microcontrollers, Analog and digital communication, Software engineering, Computer networks, Computer graphics, Web designing, Network security and management, Mobile computing, Multimedia and applications, software testing.

(iv) Mechanical Engineering Department: Basics of Electrical and Electronics Engineering, Basics of computer technology, Workshop Technology, Engineering materials, Applied mechanics, Metrology and instrumentation, Hydraulics and Pneumatics, Strength of materials, Thermodynamics, Refrigeration and air conditioning, theory of machines, Computer graphics, Production management, Machine design, Automobile engineering, CNC machines and automation, Computer applications and use of various software used in Mechanical Engineering Education.

(v) Civil Engineering Department: Engineering Drawing and Graphics, Surveying, Applied Mechanics, Hydraulics, Basic concepts of Electrical and Mechanical Engineering, Building materials, Modern Construction materials, Concrete Technology, Design of RCC structures, Theory of structures, Design of steel structures, Contract and specification in Construction, Soil Mechanics and Foundation Engineering, Building Services, Construction Engineering and Management, Construction Economy and Finance, Construction Project Management, Building Acoustics and Noise Control, Quality and Safety management, Environmental Engineering, Maintenance and rehabilitation of Constructed facilities, Transportation Engineering, Application of CAD in Civil Engineering Practice.

(vi) Biological Sciences and Engineering Department: Microbiology, Biochemistry, Cell Biology, Molecular Biology, Recombinant DNA Technology, Immunology, Bioinformatics, Bioprocess Engineering principles, Plant and Animal tissue culture, Basics techniques like spectrophotometer, centrifugation, PCR, Chromatography etc. Computer applications and use of various software used in Bio-Sciences and Engineering Education

Quantitative Ability: 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.

Reasoning & Intelligence: 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 Series, Number Series, Figural Series, Problem Solving, Word Building, Coding and de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern - folding and un-folding, Figural Pattern-folding and completion, Indexing, Address matching, Date & City matching, Classification of centre codes/roll numbers, Small and Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

(b) Difficulty level: Difficulty level of the question papers to be of ITI examination in the appropriate field.

Note: *Weightage for subject domain knowledge will be 75-80%*

Weightage for quantitative ability, reasoning and intelligency will be 20-25%

6. Lower Division Clerk (LDC)

(a) Syllabus:

Quantitative Ability: 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.

Reasoning & Intelligence: 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 Series, Number Series, Figural Series, Problem Solving, Word Building, Coding and de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space Visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern - folding and un-folding, Figural Pattern-folding and completion, Indexing, Address matching, Date & City matching, Classification of centre codes/roll numbers, Small and Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

General Studies / Current Affairs / General Knowledge: 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 event 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

neighboring Countries especially pertaining History, Culture, Geography, Economic Scene, General Policy, Indian Constitution & Scientific Research.

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 miss-spelt words, idioms and 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.

Basics of Computers: General Computer Processing ability in MS-Office like Word Processing, Excel, Power point, etc. and Operating Systems; Professional software/Hardware system relevant to the post; any other Computer/IT related Questions.

(b) Difficulty level: The difficulty level of questions to be of same as in class XII CBSE Examinations.

7. Junior Stenographer

(a) Syllabus:

Quantitative Ability: 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 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 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.

Reasoning & Intelligence: It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualizations, 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 and de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern - folding and un-folding, Figural Pattern-folding and completion, Indexing, Address matching, Date & City matching, Classification of centre codes/roll numbers, Small and Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence and other sub-topics.

General Studies / Current Affairs / General Knowledge: 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 event 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 neighboring Countries especially pertaining History, Culture, Geography, Economic Scene, General Policy, Indian Constitution and Scientific Research.

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 mis-spelt words, idioms and 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.

Basics of Computers: General Computer Processing ability in MS-Office like Word Processing, Excel, Power point, etc. and Operating Systems; Professional software/Hardware system relevant to the post; any other Computer/IT related Questions.

(b) Difficulty level: The difficulty level of questions to be of same as in class XII CBSE Examinations.

8. Assistant Store Keeper

(a) Syllabus:

Quantitative Ability: 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 and 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.

Reasoning & Intelligence: It would include questions of both verbal and non-verbal type. This component may include questions on analogies, similarities and differences, space visualizations, 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 and de-coding, Numerical Operations, Symbolic Operations, Trends, Space Orientation, Space visualization, Venn Diagrams, Drawing inferences, Punched hole/pattern - folding and un-folding, Figural Pattern-folding and completion, Indexing, Address matching, Date and City matching, Classification of centre codes/roll numbers, Small & Capital letters/numbers coding, decoding and classification, Embedded Figures, Critical thinking, Emotional Intelligence, Social Intelligence and other sub-topics.

General Studies/Current Affairs /General Knowledge: 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 event 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 neighboring Countries especially pertaining History, Culture, Geography, Economic Scene, General Policy, Indian Constitution & Scientific Research.

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 mis-spelt words, idioms and 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.

Basics of Computers: General Computer Processing ability in MS-Office like Word Processing, Excel, Power point, etc. and Operating Systems; Professional software/Hardware system relevant to the post; any other Computer/IT related Questions.

(b) Difficulty level: The difficulty level of questions to be of same as in class XII CBSE Examinations.

9. Head Clerk

(a) Syllabus:

- I. **Quantitative Ability, General Studies / Current Affairs / General Knowledge:** The questions in this component would be designed to test the quantitative ability, reasoning and intelligence and general knowledge of the candidates. **Quantitative ability:** 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. 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.

- II. **Reasoning & Intelligence:** 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. Critical thinking, Emotional Intelligence, Social Intelligence & other sub-topics.

- III. **English:** Questions in this component would be designed to test the candidate's understanding and knowledge of English language and would be based on spotting the errors, 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.
- IV. **Knowledge of Official procedures and relevant Rules and Regulations and basics of Computer :** Questions in this component would be designed to test the knowledge of the candidates in official procedures, which include- creation of official files and their records; knowledge of General Financial Rules (GFR); procedures of Stores and purchase; organising official meetings, preparing the minutes and keeping proper records; Knowledge of Right to Information act and its provisions; Knowledge of Leave Rules, Service Rules and the provisions of GPF, CPF and New Pension Scheme; Drafting and noting; public relation and communication; Correspondence with public and other Institutions; drafting of official and demi-official letters given by the officers, Knowledge of different types of letters and difference between them; Different types of Government orders, their utilization and importance (Notification, Circular, Office Order, Memorandum, etc.) General Computer Processing ability in MS-Office like Word Processing, Excel, Power point, etc.; knowledge of Operating Systems; Professional software/Hardware system relevant to the post; any other Computer/IT related Questions.

(b) **Difficulty level:** difficulty level of the questions has to be the same as in the examinations of a graduate degree of Indian Universities.

10.Upper Division Clerk (UDC)

(a) Syllabus:

Quantitative Ability:

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.

Reasoning & Intelligence:

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 & decoding, 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 sub-topics.

General Studies / Current Affairs / G.K:

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 event 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, Indian Constitution & Scientific Research.

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 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.

Basics of Computers:

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.

(b) Difficulty level: difficulty level of the questions has to be same as in the examinations of a graduate degree of Indian Universities.