

## Examination scheme and syllabus for written exam for the post of Lecturer (CSE)

| S.No. | Chapters                              | No. of Questions |
|-------|---------------------------------------|------------------|
| 1.    | Fundamentals of Computer Programming  | 10               |
| 2.    | Programming in C                      | 10               |
| 3.    | Data Structures                       | 10               |
| 4.    | OOP through C++                       | 10               |
| 5.    | Operating system                      | 10               |
| 6.    | Computer Networks                     | 10               |
| 7.    | RDBMS                                 | 10               |
| 8.    | Software engineering                  | 10               |
| 9.    | Computer Architecture and Maintenance | 10               |
| 10.   | Computer Graphics                     | 10               |
|       | <b>Total</b>                          | <b>100</b>       |

### Syllabus for written test for the post of lecturer (CSE)

#### **1. Fundamentals of Computer and Programming**

Components of PC, Internet & HTML, Usage of Computer System in various Domains, Information technology for benefits of community, Problem Solving Techniques Programming paradigms, algorithms and flowcharts

#### **2. Programming in C**

Introduction to C, Control Structures, Functions, Arrays and Structures, Pointers, Strings, File Operations

#### **3. Data Structures**

Introduction, Principles of Programming and Analysis of Algorithm, Searching & Sorting, Stacks, Queues, Linked List, Trees, Graphs

#### **4. Object Oriented Programming through C++**

Introduction to OOP, Classes and objects, Constructors & Destructors, Inheritance, Pointers in C++, Polymorphism.

#### **5. Operating Systems**

Introduction, Structure of OS, Process Management, Scheduling, File and Memory Management

#### **6. Computer Networks**

Network Topologies and Networking Devices, Transmission media, Network Reference Model, TCP/IP Layers & Protocols, Error Detection Correction Mechanisms

#### **7. Relational Database Management System**

Data Modeling, Relational data Model, Security & Integrity Specification, SQL and PL/SQL, Relational Database Design, Storage and File System, Query Processing & Transaction Processing

### **8. Software Engineering**

Introduction, SDLC, Software Project Management & Software Requirement Analysis, User Interface Design & Testing

### **9. Computer Architecture & Maintenance**

Motherboard & its Components, Storage Devices & Its Interface, Display Devices & Interfaces, I/O Devices, Power Supplies, Interfaces, PC Troubleshooting & Maintenance tools

### **10. Basics of Computer Graphics**

Raster scan display, Primitive operations, Graphics file formats, Graphics Mode Functions-Text mode, Graphic mode, Shapes, colors, Line, circle, and polygon, Transformations, Windowing & clipping- Line clipping, Polygon clipping: Sutherland–Hodgeman Polygon clipping algorithm.

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# Examination scheme and syllabus for written exam for the post of Lecturer (Civil)

II. Name of the post: Lecturer (Civil)

| S.No. | Chapters                         | No. of Questions |
|-------|----------------------------------|------------------|
| 1.    | Strength of material             | 10               |
| 2.    | Surveying                        | 10               |
| 3.    | Concrete Technology              | 10               |
| 4.    | Geotechnical Engineering         | 10               |
| 5.    | Environmental engineering        | 10               |
| 6.    | Transportation engineering       | 10               |
| 7.    | Construction Management          | 10               |
| 8.    | Estimation Costing and Valuation | 10               |
| 9.    | Theory of Structures             | 10               |
| 10.   | Design of RCCC structures        | 10               |
|       | <b>Total</b>                     | <b>100</b>       |

## **SYLLABUS FOR THE WRITTEN TEST FOR THE POST OF LECTURER (CIVIL)**

### **1. Strength of Materials**

- a. Stresses & Strain.
- b. Bending Stresses.
- c. Shear stress.
- d. Torsion.
- e. Columns.

### **2. Surveying**

- a. Chain Compass and Plane Table Surveying.
- b. Leveling and applications.
- c. Theodolite surveying.
- d. Area & Volume calculation, setting out works.
- e. Tachometric surveying.

### **3. Concrete Technology**

- a. Cement.
- b. Aggregate & Fresh Concrete.
- c. Hardened Concrete.
- d. Durability Properties.
- e. Mix design.

### **4. Geotechnical Engineering**

- a. Index properties.
- b. Soil Hydraulics.
- c. Stress Analysis.
- d. Soil Compressibility.
- e. Shear Strength.

### **5. Environmental Engineering**

- a. Sources of water and intakes.
- b. Quality of Water.
- c. Water Treatment system.
- d. Distribution System.
- e. Collection, Transport and Treatment of sewage.

f. Disposal of sewage.

**6. Transportation Engineering**

- a. Highway Geometry.
- b. Highway Materials.
- c. Flexible Pavements.
- d. Rigid Pavements.
- e. Construction and Maintenance.

**7. Construction Management**

- a. Construction Project Management.
- b. Organization and Planning.
- c. Scheduling and Network Analysis.
- d. Contracts.
- e. M.I.S Application and Construction.

**8. Estimation Costing and Valuation**

- a. Estimation of buildings.
- b. Estimation of other structures.
- c. Specification and rate analysis.
- d. Valuation.

**9. Theory of Structures**

- a. Slope deflection method.
- b. Moment distribution method.
- c. Fixed beam.
- d. Analysis of continuous beam

**10. Design of R.C.C Structures**

- a. Limit state design of Beams and Slabs.
  - b. Limit state design of Columns.
  - c. Limit state design of Footings and Staircases.
  - d. Design of brick masonry walls.
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# Examination scheme and syllabus for written exam for the post of Lecturer (Maths)

III. Name of the post: Lecturer (Maths)

| S.No. | Chapters            | No. of Questions |
|-------|---------------------|------------------|
| 1.    | Algebra             | 10               |
| 2.    | Trigonometry        | 10               |
| 3.    | Coordinate geometry | 10               |
| 4.    | Menstruation        | 10               |
| 5.    | Statistics          | 10               |
| 6.    | Numerical aptitude  | 50               |
|       | <b>Total</b>        | <b>100</b>       |

## Syllabus for the written test for the post of Lecturer (Math's)

### Algebra

1. Logarithm: Concept and laws of logarithm
2. Determinant and matrices
  - a) Value of determinant of order  $3 \times 3$
  - b) Solutions of simultaneous equations in three unknowns by Cramer's rule.
  - c) Matrices, algebra of matrices, transpose adjoint and inverse of matrices.
  - d) Solution of simultaneous equations by matrix inversion method.
3. Types of partial fraction based on nature of factors and related problems.

### Trigonometry

1. Trigonometric ratios of Compound, allied, multiple and sub-multiple angles (without proofs)
2. Factorization and de-factorization formulae (without proofs)
3. Inverse trigonometric ratios and related problem.
4. Principle values and relation between trigonometric and inverse trigonometric ratio.

### Coordinate Geometry

1. Straight line and slope of straight line
  - a) Angle between two lines
  - b) Condition of parallel and perpendicular lines.
2. Various forms of straight lines.
  - a) Slope point form, two point form.
  - b) Two points intercept form.
  - c) General form.
  - d) Perpendicular distance from a point on the line.
  - e) Perpendicular distance between two parallel lines.

### Mensuration

1. Area of regular closed figures, Area of triangle, square, parallelogram, rhombus, trapezium and circle.
2. Volume of cuboids, cone, cylinders and sphere.

### **Statistics**

1. Range, coefficient of range of discrete and grouped data.
2. Mean deviation and standard deviation from mean of grouped and ungrouped data, weighted means.
3. Variance and coefficient of Variance
4. Comparison of two sets of observation.

## **Numerical Aptitude**

This section will include question from following topics:

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

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

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

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

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

**Trigonometry:** Trigonometry, Trigonometric ratios, Complementary angles, Height and distances

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

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## Examination scheme and syllabus for written exam for the post of Lab Technician (Civil), Lab Technician (CSE), Physical Training Instructor, MTS

IV. Name of the post: Lab Technicians (Civil)

| S.No. | Chapters                | No. of Questions |
|-------|-------------------------|------------------|
| 1.    | English Language        | 20               |
| 2.    | General Awareness       | 20               |
| 3.    | Numerical aptitude      | 20               |
| 4.    | General intelligence    | 20               |
| 5.    | Basic Civil engineering | 20               |
|       | <b>Total</b>            | <b>100</b>       |

V. Name of the post: Lab Technicians (Computer)

| S.No. | Chapters                   | No. of Questions |
|-------|----------------------------|------------------|
| 1.    | English Language           | 20               |
| 2.    | General Awareness          | 20               |
| 3.    | Numerical aptitude         | 20               |
| 4.    | General intelligence       | 20               |
| 5.    | Basic Computer Engineering | 20               |
|       | <b>Total</b>               | <b>100</b>       |

VI. Name of the post: Physical Training Instructor

| S.No. | Chapters                  | No. of Questions |
|-------|---------------------------|------------------|
| 1.    | English Language          | 20               |
| 2.    | General Awareness         | 20               |
| 3.    | Numerical aptitude        | 20               |
| 4.    | General intelligence      | 20               |
| 5.    | Rules on sports and games | 20               |
|       | <b>Total</b>              | <b>100</b>       |

VII. Name of the post: MTS

| S.No. | Chapters             | No. of Questions |
|-------|----------------------|------------------|
| 1.    | English Language     | 20               |
| 2.    | General Awareness    | 30               |
| 3.    | Numerical aptitude   | 30               |
| 4.    | General intelligence | 20               |
|       | <b>Total</b>         | <b>100</b>       |

**Syllabus for the Written Test for the post of Lab Technician (Civil /CSE)**  
**/ Physical Training Instructor / MTS**

1. **English Language:** This section will include Spot the Error, Fill in the Blanks, Synonyms/Homonyms, Antonyms, Spellings/ Detecting Mis-spelt words, Idioms & Phrases, One word substitution, Improvement of Sentences, Active/Passive Voice of Verbs, Conversion into Direct/Indirect narration, Shuffling of Sentence parts, Shuffling of Sentences in a passage, Cloze Passage, Comprehension Passage.
2. **General Awareness:** This section will include questions relating to India and other countries especially pertaining to History, culture, Geography, Economic Scene, General policy, Scientific Research, Union Budget, Railway Budget, Economy, Current Affairs (Events of National & International importance) and Static GK (Awards, Books and Authors etc)
3. **Numerical Aptitude:** This section will include question from following topics:
  - Number Systems:** Computation of Whole Number, Decimal and Fractions, Relationship between numbers
  - Fundamental arithmetical operations:** Percentages, Ratio and Proportion, Square roots, Averages, Interest (Simple and Compound), Profit and Loss, Discount, Partnership Business, Mixture and Allegation, Time and distance, Time and work.
  - Algebra:** Basic algebraic identities of School Algebra and Elementary surds (simple problems) and Graphs of Linear Equations.
  - Geometry:** Familiarity with elementary geometric figures and facts, Triangle and its various kinds of centre, Congruence and similarity of triangles, Circle and its chords, tangents, angles subtended by chords of a circle, common tangents to two or more circles.
  - Mensuration:** Triangle, Quadrilaterals, Regular Polygons, Circle, Right Prism, Right Circular Cone, Right Circular Cylinder, Sphere, Hemispheres, Rectangular Parallelepiped, Regular Right Pyramid with triangular or square Base.
  - Trigonometry:** Trigonometry, Trigonometric ratios, Complementary angles, Height and distances
  - Statistical Charts:** Use of Tables and Graphs: Histogram, Frequency polygon, Bar-diagram, Pie-chart.
4. **General Intelligence:** Both verbal and non-verbal type questions. This section will include questions on Semantic Analogy, Symbolic operations, Symbolic/Number Analogy, Trends, Figural Analogy, Space Orientation, Semantic Classification, Venn Diagrams, Symbolic/Number Classification, Drawing inferences, Figural Classification, Punched hole/pattern-folding & unfolding, Semantic Series, Figural Pattern – folding and completion, Number Series, Embedded figures, Figural Series, Critical Thinking, Problem Solving,



Emotional Intelligence, Word Building, Social Intelligence, Coding and de-coding, Other sub-topics, if any Numerical operations.

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## **Syllabus for Basic Civil Engineering**

### **Natural Construction Materials**

- a) Stone – Physical Classification of rocks; Requirements of good building stone, characteristics of stone, Quarrying and dressing of stone.
- b) Timber – Timber as construction material, structure of timber, properties of good timber, seasoning of timber, defects in timber.
- c) Bituminous materials and mixtures: Terminology, different types of asphalt, bitumen, tar used in Civil Engineering works, their properties and uses
- d) Lime – Manufacture of lime, classification, field slaking of lime and properties of lime
- e) Soil –terminology- sand, silt, clay and their suitability in construction work.

### **Artificial Construction Materials**

- a) Bricks – Brick earth and its constituents. Conventional bricks and Standard bricks. Characteristics of good brick, Classification of burnt clay bricks and their suitability, special bricks. Manufacturing of burnt clay bricks.
- b) Common Field tests on Bricks- shape and size, colour, sound, hardness test, finger scratch test, water absorption test
- c) Tiles –flooring and roofing tiles. Characteristic of good tiles, different types of tiles depending upon material used, sizes of tiles, uses of tiles, wall cladding
- d) Materials for making concrete-: Cement – definition, Manufacturing of cement, types of cements – ordinary Portland, white cement colour cement and their suitability.
- e) Different brand name of cement, common pickings available in markets, common field tests on cement- lumps visible, colour, hand feeling, water float test
- f) Aggregate – Definition, types of aggregate - coarse aggregate, fine aggregates (size).
- g) Artificial sand – properties and advantages, suitability
- h) Pre-cast concrete products – concrete blocks- hollow, solid concrete blocks, pavement blocks, balustrades, their properties and uses.
- i) Plywood, particle board and veneers their properties and uses.
- j) Glass – properties- thickness and weight, thermal conductivity, light and heat translation, durability sound insulation, types of glass- soda lime glass, lead glass and borosilicate glass. Glass used for cladding.

## **Syllabus for Basic Computer Engineering**

### **Fundamentals of Computer and Programming**

Components of PC, Internet &HTML, Usage of Computer System in various Domains, Information technology for benefits of community, Problem Solving Techniques Programming paradigms, algorithms and flowcharts