

Recruitment of Assistant Administrative Officers (Generalist & Specialist) 32nd Batch

SYLLABUS FOR MAIN EXAMINATION **(Syllabus is illustrative in nature and not exhaustive)**

For the Recruitment of Asst. Engineer (Civil)

C-1. Construction Technology:

Engineering Materials:

Physical Properties of construction materials with respect to their use in construction – Aggregates, Bricks and Tiles, Cement, different types of Mortars and concrete.

C-2. Construction:

Masonry principles using Brick, Stone, Blocks

Types of Plastering, point, flooring, roofing and construction features.

Common repairs in buildings.

Principles of functional planning of building for residents and specific use – Building code provisions.

Basic principles of detailed and approximate estimating – specification writing and rate analysis – principles of valuation of real property.

Machinery for earthwork, concreting and their specific uses.

C-3. Construction Planning and Management:

Construction activity – schedules – organization for construction industry – Quality assurance principles.

Use of basic principles of network – analysis in form of CPM and PERT – their use in construction monitoring, cost optimization and resource allocation.

C-4. Surveying:

Common methods and instruments for surveying required for building construction

C-5. Introduction:

- CPWD – Schedule of Rates
- Estimation
- Bar Bending Schedule
- Knowledge of NBC and IS codes.

C-6. Basic principles of Analysis of Rates:

- Methodology of (AOR) Analysis of rates
- Market Rate Item
- Quotation from vendor

C-7. Principles of Construction Contracts:

- Item rate
- Lump sum
- EPC
- Statutory Provisions of contract
- Labour Laws

C-8. Quality Control and Assurance:

- For Pavement work
 - Rigid (PQC)

- Flexible (Bituminous)
- For building works
 - Material – Bricks, Aggregate, Sand, Steel, Cement, Glass and other important building materials.

C-9. Project Management:

- MS Project / Primavera
- Revision of schedule
- Critical Activity etc.
- Milestones.

C-10. Water Supply:

Estimating of demand for water, Standards for portable water, Water conservation – Rain Water Harvesting.

C-11. Sewage treatment:

Working principles, units, chambers, sedimentation tanks, trickling filters, oxidation ponds, activated sludge process, septic tank, disposal of sludge, recycling of wastewater.

C-12. Introduction of automation in construction:

Concept, need, examples related to different civil engineering projects.

C-13. Basic computer software usage:

Basic knowledge of MS Office (MS Word, MS Excel, MS Power Point), Drawing Software (Auto CAD)

For the Recruitment of Asst. Engineer (Electrical)

E-1. Circuit Theory:

Circuit components; networks graphs; KCL; KVL; circuit analysis methods; nodal analysis, mesh analysis; basic network theorems and applications; transient analysis; RL, RC, and RLC circuits; Two-port networks.

Instrumentation: Insulation megger, earth megger, Kelvin's double bridge, Quadrant electrometer, Rotating substandard, TOD meter.

E-2. Electrical Machines:-

- a) **Transformers:** Construction details – Principles of operation – vector diagrams on no load and load – regulation and efficiency – equivalent circuits and test for the determination of parameters of equivalent circuits – types of three phase transformers and their applications – Scott connection of transformers.
- b) **3- Phase Induction Motors:** Principle of operation – Cage and Slip ring motors – torque slip characteristic – methods of speed control.
- c) **3- Phase Alternators:** Principles of operation and constructional details – types of Alternators – Synchronous impedance – voltage regulation – short circuit ratio and its importance – phasor diagrams of round rotor and salient pole machines synchronization – behavior of an alternator connected to infinite bus – effect of varying excitation and mechanical torque – power angle curves – control of active and reactive powers.
- d) **Single Phase Induction Motors:** Types of single phase motors – Types of Single Phase Induction motors – characteristics and methods of starting – shaded pole induction motor.

E-3. Power System Protection:

Principles of over current, differential and distance protection, Concept of Solid state relays, Circuit breakers.

Line Bus, generator, transformer protection; numeric relays and application to DSP to protection.

E-4. Transmission and Distribution:

- a) **Over Head Line Insulators:** Types of Insulators – Potential distribution over a string of suspensions insulators – string efficiency – Methods of improving string efficiency.

- b) **Cable:** Insulators of cables, Grading of cables – Capacitance Measurements in cables – Testing of cables – Power frequency withstand tests.
- c) **Protection:** Characteristic of Relays – Over current, directional distance protection of lines.
- d) **Circuit Breakers:** Air – blast, oil, minimum oil, vacuum – sulphur hexafluoride and d c circuit breakers – Relative merits and demerits.

E-5. Sub-station

- I. HT Panels
 - HT overhead Lines
 - HT cables
- II. Transformers
 - LT Panels, LT Cables
 - Bus Duct, Capacitor panels
 - Cable Trench, Cable Tray

E-6. DG Sets / UPS

- AMF Panel
- Synchronization
- SCADA

E-7. Internal Electrification

- Wiring
- Conducting
- Fitting/Fixtures
- Fans

E-8. Fire Alarm & Fire Fighting System

- Fire Alarm & Detection
- Wet Riser
- Down Comer
- Sprinkler System
- Fire Suppression System

E-9. Earthing

- Lightning Protection System
- CCTV / PA System
- Solar Power System
- Codes and services in buildings.

E-10. Elements of Electrical Engineering

1. **A. C. Circuits:** Generation of alternating voltage and current, RMS and average value, form factor, crest factor, AC through resistance, inductance and capacitance, R-L, R-C, and R-L-C series and parallel circuits, phasor diagrams power and power factor, series and parallel resonance, Q-factor and bandwidth.
2. **Three Phase Circuits:** Three phase voltage and current generation, star and delta connections (balanced load only), relationship between phase and line currents and voltages, Phasor diagram, Basic principle of wattmeter, measurement of power by two wattmeter method.
3. **Single phase transformer:** Construction, working principle, Emf equation, ideal and practical transformer, transformer on no load and on load, phasor diagrams, equivalent circuit, O. D. and S. C. test efficiency.

E-11. Basic Computer Software Usage:

Basic Knowledge of MS Office (MS Word, MS excel, MS Power Point); Drawing Software (Auto CAD)

For the Recruitment of Company Secretary

The paper will be based on:

1. Company Law
2. ISDR SEBI: Issue of capital and disclosure
3. SEBI- SAST Regulation (Substantial Acquisition of Shares and Takeovers) Regulations, 2011
4. SEBI- PIT Log (Prohibition of Insider Trading)
5. Drafting of resolution/notes

For the Recruitment of Chartered Accountants

The paper will be based on:

1. Financial Accounting
2. Financial Reporting (Including GAAP & IndAS)
3. Commercial Laws
4. Taxation- Direct & Indirect
5. Information Technology
6. Risk Management and Internal Financial Control

For the Recruitment of Legal Officers

The paper will be based on Contract Act interpreting various Laws viz., Banking, Negotiable Instruments, Company, and Cooperative Laws, Cyber Laws Commerce/Property transactions, Life Insurance, Staff matters and Good experience in drafting various types of documents.

For the Recruitment of Actuarial

The paper will be based on the syllabus prescribed by the Institute of Actuaries of India, under the subjects CS1, CS2, CM1, CM2, CB1, CB2 & CB3

For the Recruitment of Insurance Specialist

The paper will be based on the syllabus prescribed by the Insurance Institute of India, under the subjects IC85, IC86, IC89, IC92, AS 03, AS 05(iv), AS 05(v)
