INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI-600036.

Advertisement No. IITM/R/2/2024 dated 02.03.2024

Syllabus & Scheme of Examination for the post of Superintending Engineer

Syllabus

LEVEL-1 Descriptive Test (Essay type Q&A and Case Studies)

Civil Engineering (If the basic Degree is in Civil Engineering)

Building Planning and Construction

Principles of building planning and design, integrated approach, building bye-laws, building services such as vertical transportation, water supply, sanitation, thermal ventilation, lighting, acoustics, fire protection, and electrical fittings.

Types of foundations, stones, brick and block masonry, steel and reinforced cement concrete structures, floors, doors and windows, roofs, finishing works, waterproofing, modern construction materials, repair and rehabilitation, and maintenance of facilities.

Water supply Engineering

Sources of supply, design of intakes, estimation of demand, water quality standards, primary and secondary treatment, maintenance of treatment units, conveyance and distribution of treated water, rural water supply.

Wastewater Engineering and Pollution Control

Quantity, collection and conveyance and quality, disposal, design of sewer and sewerage systems, pumping, characteristics of sewage and its treatment, rural sanitation, sources and effects of air and noise pollution, monitoring, and standards. Recycling and Reuse of treated sewage water.

Electrical Engineering (If the basic Degree is in Electrical Engineering)

Circuit Analysis:

DC circuit elements, ideal current and voltage sources, work power energy calculations, Work power energy calculations in AC series and parallel circuits.

AC Circuits

Representation of sinusoidal waveforms, peak and rms values, phasor representation, real power, reactive power, apparent power, power factor. Analysis of single-phase ac circuits consisting of R, L, C, RL, RC, RLC combinations (series and parallel), resonance. Three-phase balanced circuits, voltage and current relations in star and delta connections

Transformers

Transformers-principles and performance of Single phase and three phase transformers; three phase transformers connections, parallel operation, auto-transformer, energy conversion principles.

Ac Machines

AC Machines- Principles, performance characteristics of single phase and three phase induction motors; Synchronous machines - performance, regulation, parallel operation of generators, motor starting. Applications. Special Machines- Servo Motors, Stepper motors, BLDC and PMSM motors-Characteristics and applications. Linear motors

Illumination

Illumination system design for residential, commercial, industrial categories. Solar powered illumination and associated economics.

Utilization

Pump types and characteristics, Pump curves, Factors affecting pump performance, Efficient pumping system operation, and Energy conservation in pumping systems. Fan and Compressor types, Fan and compressor performance evaluation and efficient system operation, Compressor capacity assessment, Energy saving opportunities in fans and Compressors.

Control and instrumentation

Open loop and closed loop control system, transfer function, block diagrams and signal flow graphs representation and simplification, steady-state errors, Routh-Hurwitz criterion, Nyquist techniques, Bode plots, root loci. transient and frequency response analysis, ammeter, voltmeter, kwh meter, wattmeter, PF meter.

Common for Both Civil Engineering and Electrical Engineering

Estimation and costing

Contracts and specifications, contract management, dispute resolution, arbitration

Tendering, GFR, Arbitration, RTI, GRIHA, green building concepts, Drainage

Waste Management & Waste to Energy: Sources, classification, collection, treatment and disposal. Waste to Energy, regulations, CPCB and EPA guidelines.

Disaster management: Prevention and mitigation

Labour Welfare: Working conditions - Regulation of Work hour including overtime, health & safety practices

HRM: Conflict Management Strategies & Techniques, Group and Team Management - Norm, Decision Making, Team Size, Team Effectiveness, Managerial Roles, Planning, Staffing, Coordinating and Controlling.

LEVEL – 2 Presentation by the Candidate & Interview

Presentation by the Candidate :

The candidate for the post of Superintendent Engineer is expected to make a comprehensive presentation (15 minutes) highlighting the following aspects from their own experience and expertise:

- Brief about the contracts/consultancy/project implementation works undertaken for their organization
- Own experience relevant to project implementation and campus maintenance
- Project planning and latest management technology / other relevant software
- Contract Management, Financial Management, GFR and Building codes etc
- Liaison with Project implementation agencies like PWD, CPWD, MES etc.

  Vision/Plan for the estate management and campus improvement work of the Institute

- Syllabus mentioned under Level-1 above
- Noting and Drafting

Personal Interview

- Syllabus as mentioned for Descriptive Test
- The Interview/personality test shall be conducted in such a manner that the candidate's suitability for the post is tested, among other things, through academic qualifications, experience, general awareness/knowledge, communication and problem-solving skills, and overall personality, etc.

Scheme of Examination :

Level	Type of Test	Weightage for the final result
Level -1	Descriptive Test	60%
Level – 2	Presentation	15%
Level – 2	Personal Interview	25 %

- A minimum of 7 candidates shall be called for Personal Interviews based on their performance in Level-1 and Level-2 Tests.

———