

INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI-600036.

Advertisement No. IITM/R/4/2024 dated 11.03.2024

Syllabus & Scheme of Examination

Post: Technical Officer

Stream: ECE

LEVEL-1 Multiple Choice Question Test

(100 Marks)

PART – A

(30 Marks)

1. **Quantitative aptitude:** Number systems, simplification, decimals, fractions, LCM, HCF, ratio & proportion, percentage, log and trigonometric functions, solutions of simple equations (linear and quadratic), basic statistics – mean and standard deviation, profit & loss, discount, simple & compound interest, mensuration, time & work, time & distance, tables & graphs.
2. **Logical reasoning aptitude:** Analogies, similarities, differences, space visualization, analysis, judgment, decision making, visual memory, discrimination, observation, relationship concepts, arithmetical reasoning, verbal and figure classification
3. **Computer-related aptitude:** Hardware, software, operating systems, basic operations in MS Office - Word, Excel, PowerPoint
4. **Language aptitude:** Comprehension, vocabulary, and basic grammar in English.
5. **General awareness aptitude:** Current events, general knowledge, Indian history, Indian constitution, basic geography.

PART – B

(70 Marks)

1. **Electric circuits:** Ideal voltage and current sources, R, L, C, M elements; Network solution methods: KCL, KVL, Mesh analysis; Network Theorems: Thevenin's, Norton's, Superposition and Maximum Power Transfer theorem; sinusoidal steady-state analysis, resonance, balanced three phase circuits, star-delta transformation, power factor in ac circuits.
2. **Transformer:** Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, efficiency; Auto-transformer
3. **Analog Circuits:** Diode circuits: clipping, clamping and rectifiers. BJT and MOSFET amplifiers: differential amplifiers. Op-amp circuits: Amplifiers, summers, differentiators, integrators, active filters, Schmitt triggers and oscillators.
4. **Digital Electronics:** Number representations: binary. Combinatorial circuits: Boolean algebra, minimization of functions using Boolean identities and Karnaugh map, logic gates, multiplexers, decoders. ADCs and DACs. Computer organization.
5. **Instrumentation:** Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; voltmeters and multimeters, Phase, Time and Frequency measurement;
6. **Communications:** Analog communications: amplitude modulation and demodulation, FM, superheterodyne receivers. Digital communications: PCM, DPCM, digital modulation schemes (ASK, PSK, FSK, QAM), bandwidth, SNR. Fundamentals of error correction.

LEVEL – 2 Professional Competence Test

- **The Professional Competence Test will be a Descriptive Test and/or Laboratory based Test** for testing Professional Competence on the topics mentioned under Part-B for Level-1 Test.

LEVEL – 3 Personal Interview

- Syllabus as mentioned for Professional Competence 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	Time	No. of Questions – Max. Marks	Weightage for the final result
Level -1	Multiple Choice Question Test	Time: 120 Minutes	100 Objective Questions – 100 Marks	40 %
Level-2	Professional Competence Test	Time: 90 minutes approximately	Descriptive / Practical Test	30 %
Level-3	Personal Interview		40 Marks	30%

- A minimum of 7X candidates shall be shortlisted (for X number of posts advertised) for the Level-2 Professional Competence Test based on their performance in the Level-1 Multiple Choice Question Test.
- A minimum of 3X candidates shall be called for Personal Interviews based on their performance in Level-1 and Level-2 Tests.

NOTE:

- a) The medium of examination will be ENGLISH
- b) The questions will generally be on the minimum qualification level.
- c) There shall be no negative marking for wrong answers.
- d) **The Level-1 Multiple Choice Question Test is tentatively scheduled to be held on 07th February 2025 at TCS iON Centres in Chennai.**