INDIAN INSTITUTE OF TECHNOLOGY MADRAS, CHENNAI– 600036

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RECRUITMENT FOR THE POST OF JUNIOR TECHNICIAN (ECE / E&I / EE)

Syllabus for 2 Levels of selection process

Candidates will be given option to choose one of the following Two sets of syllabus at the start of the computer-based MCQ Test:

Option-1: ECE & EI- paper

Option-2: EE- paper

Candidates should decide carefully and make this selection- once the option is exercised by the candidate, the question paper opted by the candidate will only be available.

Option-1: ECE & EI- paper syllabus

Level-1 Test: Syllabus for Computer-based Multiple Choice (MCQ)Test:

1. General Aptitude: English Language & Grammar, Verbal and Non-Verbal Reasoning, Aptitude, General Knowledge, and General Awareness & General Science.

2. 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.

3. Transformer: Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, efficiency; Auto-transformer

4. 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.

5. 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.

6. Instrumentation: Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; voltmeters and multimeters, Phase, Time and Frequency measurement;

7. 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.

Results of Level-1 test will be published in the Institute recruitment portal https://recruit.iitm.ac.in
Email intimation will be sent to the short-listed candidates for Level-2 test.
Level-2 test will be scheduled tentatively during third week of August 2023.

Level – 2 Test: Syllabus for Trade Test:

Syllabus for ECE & EI paper as above (Except Sl.No.1).

Option-2: EE paper Syllabus

Level-1 Test: Syllabus for Computer-based Multiple Choice (MCQ)Test:

1. General Aptitude: English Language & Grammar, Verbal and Non-Verbal Reasoning, Aptitude, General Knowledge, and General Awareness & General Science.

2. 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.

3. Transformer: Single phase transformer: equivalent circuit, phasor diagram, open circuit and short circuit tests, efficiency; Three-phase transformers: connections; Auto-transformer

4. Electrical Machines: DC machines: separately excited, series and shunt, motoring and generating mode of operation and their characteristics; Three-phase induction machines: principle of operation, types, performance, no-load and blocked-rotor tests, starting; Operating principle of single-phase induction motors; Synchronous machines: cylindrical and salient pole machines, starting of synchronous motors; Types of losses and efficiency calculations of electric machines.

5. Power Systems: Basic concepts of electrical power generation, ac and dc transmission concepts, insulators, Distribution systems, Power factor correction, Circuit breakers.

6. Instrumentation: Bridges and Potentiometers, Measurement of voltage, current, power, energy and power factor; Instrument transformers, voltmeters and multimeters, Phase, Time and Frequency measurement; Oscilloscopes.

7. Analog and Digital Electronics: Simple diode circuits: clipping, clamping, rectifiers; Amplifiers, combinatorial and sequential logic circuits, multiplexers, demultiplexers, Schmitt triggers, sample and hold circuits, A/D and D/A converters.

8. Power Electronics: Static V-I characteristics and firing/gating circuits for Thyristor, MOSFET; Single and three-phase configuration of uncontrolled rectifiers; SMPS, Single-phase inverter, sinusoidal pulse width modulation.

Results of Level-1 test will be published in the Institute recruitment portal https://recruit.iitm.ac.in
Email intimation will be sent to the short-listed candidates for Level-2 test.
Level-2 test will be scheduled tentatively during third week of August 2023.

Level – 2 Test: Syllabus for Trade Test:

Syllabus for EE paper as above (Except Sl.No.1)
