Question Type for M.Tech Admission Test (MTAT) : 2025

Question setting type will be uniform for all the departments as follows :

i. Qs 1 to Qs 50 (MCQ type), carrying 1 mark each with 25% negative mark for each wrong answer.   [Please set at least 10 Q of this type and provide Answers/solutions]

ii. Qs 51 to Qs 75 (MCQ type) carrying 2 marks each with 25% negative mark for each wrong answer. [Please set at least 5 Q of this type and provide Answers/solutions]

Syllabus for M.Tech Admission Test (MTAT) : 2025
Electrical Engineering
INSTRUMENTATION & CONTROL ENGG

1. **Electrical Science**: Network Theorems, D.C. networks, A.C. network fundamentals & phasor concepts, Series-Parallel A.C. networks, Energy & Power in electric circuits.

2. **Electrical Circuit Analysis/Signals & Systems**: Transients, Resonance, Transforms & properties: Laplace, Fourier, Z-transform, Discrete-time Fourier Transform, Discrete Fourier Transform, Fast Fourier Transform, Electrical Circuit Analysis using Laplace & Fourier Transforms, Properties of networks in terms of poles and zeros, Transfer function, Resonant circuits, Three-phase circuits, Two-port networks.

3. **Digital Electronics & Logic Design**: IC logic families : DTL, TTL, ECL, NMOS, PMOS & CMOS gates and their comparison, Logic gate circuits, Combinatorial Logic design using K-map, Multiplexer, Demultiplexer, Decoder, Encoder, Adder, Subtractor, Comparator, Multiplier, Divider, Latch, Sequential logic circuits: Flip-flops, Registers, Counters & Waveform generators, ROMs & Semiconductor Memories.

4. **Electrical Machines:** Theory, construction, losses & efficiency, operation of Transformer, D.C. Machines, Synchronous Machines, Single Phase Induction motor, 3-phase Induction machines, Universal motor.

5. **Power Electronics & Electric Drives**: Power devices – Diode, Power transistor, Thyristor, Triac, Gate Turn-Off Thyristor (GTO), Power MOSFET, UJT; Diac & IGBT; Rectifier, Inverter, Chopper, Cycloconverter.

6. **Automatic Control Systems**: Concept of automatic control systems; Classifications of Control systems; Block diagram and signal flow graphs; Mathematical modelling of physical systems: Potentiometer, Synchros, DC & AC Servomotors, Rotating Amplifier, Stepper Motor, Tachogenerators; Transient and steady state response of control systems; Effect of feedback on stability and sensitivity; Root locus techniques; Frequency response analysis: Bode plot, Concepts of gain and phase margins; Constant-M and Constant-N Nichol's Chart; Approximation of transient response from Constant-N Nichol's Chart; Approximation of transient response from closed loop frequency.