

## PROFORMA

## DETAILS OF ENTRANCE TEST-2021-2022

Name of the Faculty: **Faculty of Engineering and Technology**  
 Department/Centre: **Department of Electrical Engineering**  
 Name of the Program: **M. Tech in Control and Instrumentation System (CIS)**  
 About Program's Prospects: --  
 Summary of Entrance Test

S. No.	Test Components (Strike off, if not applicable)	Test Duration (in minutes)	Max. Marks	Passing Marks	Negative Marking (Yes/No)
1	(Objective/Multiple Choice Questions)	90 Minutes	100	15%	Yes

Any other Information about the Entrance Test:

## Important Instruction

1. Calculator and other Electronic gadgets are **not allowed**
2. **Permissible** material/equipment for entrance Test
  - Black/Bull Pen
  - Pencil

## Detailed Syllabus for the Entrance Test

**AC and DC Network Analysis**

Nodal and Mesh Analysis, Theorems: Superposition, Thevenin, Norton, Maximum Power Transfer, Substitution, Compensation, Millman and Tellegan. Graph theory. Steady State and Transient Response of Networks. Resonance. Basic Filters. Two Port Networks, Three Phase Circuits. Signals and Systems, Fourier Series representation of Continuous Periodic signal, Sampling theorem, Fourier, Laplace and Z-Transforms.

**Control Systems**

Mathematical Modelling of Physical Systems. Principles of Feedback. Transfer Function. Block Diagrams. Signal Flow Graphs. Time Domain Analysis of Control System. Stability Concepts. Routh-Hurwitz's stability criterion. Steady State Errors. Routh and Nyquist Techniques. Bodes Plot. Root-Locus Plots. Polar Plot. Design of Proportional, Integral, Derivative, PI, PID Controllers. Lag, Lead and Lead-Lag Compensation. Control System Analysis using State Space Technique. State Transition Matrix. Controllability and Observability. Conversion of State Variable Models to Transfer Functions.

**Measurement & Instrumentation**

Error Analysis. Measurement Standards. Classification of Instruments; Moving iron instruments, torque equation, Moving Coil Instruments, Permanent magnet and dynamometer types. Thermal, Electrostatic, Induction, Rectifier Instruments. Ammeter shunts on dc and ac, Voltmeter multipliers. Instrument transformers, Current Transformer (CT) & Potential transformer (PT). Power measurement in single phase and three phase circuits. Classification of energy meters. Single and multi phase watt-hr meter. Power Factor meter, Frequency meter and Synchroscope. Measurement of resistance. AC Bridge. Magnetic measurements. Transducers- Thermistors, LVDT. Measurement of non-electrical quantities-displacement, strain, pressure, torque, velocity, temperature.

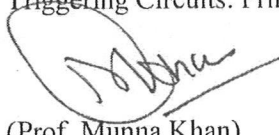
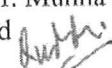
**Electronics and Communications**

Diode and Transistor Characteristics. Biasing and Stability. Frequency Response. Oscillators and Feedback Amplifiers. Operational amplifiers. Logic Gates. Boolean Algebra, Minimization techniques. Combinational circuits, A/D and D/A converters. Flip-Flops. Registers and Counters. 8-bit Microprocessors; Architecture, Programming and Interfacing. Amplitude modulation- its generation and detection. Frequency modulation- its generation and detection. Sampling theorem. Pulse Modulation; PAM, PWM, PPM. Pulse Code Modulation (PCM); Quantization, Encoding, Quantization Error. Delta Modulation. TDM. FDM.

**Power Electronics**

Characteristics and Operation of Power Diodes, MOSFET, IGBT and Thyristor Family: SCR, TRIACS, GTO. Triggering Circuits. Principles and Operation of Single Phase; Half Wave, Full Wave Converters and Choppers.

(Prof. Munna Khan)

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