CONVOLUTION 2026

CIRCUISTICS 2026

INTRODUCTION:

This event mainly focuses on Electrical & Electronic circuits,where participants are tested on their knowledge of basic of Electrical & Electronic Engineering and their skill of building fuctional circuits from scratch.

TIMELINE OF THIS EVENT:

Day-1 **(Date will be notified later)**	**PRELIMS (for both Tier-1 & Tier-2)** **(TIME: 1 hr)**
Day-2 **(Date will be notified later)**	**FINALS (for both Tier-1 & Tier-2)** **(3hrs for Hardware Design)**

RULES & REGULATION:

- **There will be two Tiers for this event: Tier-1 for UG1 and UG2 and Tier-2 for UG3 and UG 4.**

a. PRELIMS

- **For Tier-1, there will be two different sets of question papers: one for UG1 & another for UG2. Tier-2 will have the same question paper (a circuit design problem) provided to both years.**
- **Questions will be mostly MCQ and NAT in the PRELIMS . There may be some MSQ'sS also.**
- **Participants just need to bring their pen, exam board and calculator. Rough sheets will be given.**
- **Each participant in a team will be given an individual question paper but only one OMR per team which needs to be properly marked, and that will be considered as the final answer script of that team.**

- **Discussion among team members is allowed but between other teams & use of any electronic device other than calculator is not allowed. Such use of unfair means if found shall lead to immediate disqualification of the respective team.**

b. FINALS

- **The top 8 teams will move to the FINALS from each tier.**
- **All hardware components required to build the circuit will be provided to the respective teams.**
- **Finalists of both Tiers will have to build a fully functional electronic circuit according to the given problem statement.**
- **Winner will be selected by the judges. The decision of the judges shall be final and binding. No appeals, objections or challenges shall be entertained.**
- **Prizes will be distributed after the finals.**

SYLLABUS FOR PRELIMS:

➢ TIER-1: (UG-1):

Network Theory: RL, RC, RLC circuits, D.C. Network theorems (Superposition Theorem, Thevenin's Theorem, Norton's Theorem, Maximum Power Transfer Theorem), A.C. Resonance, Steady state analysis w.r.t A.C. circuits, Analog Electronics: Diode basics, Zener diode, Diode circuits (Rectifier, Clipper, Clamper) Digital Electronics: Logic gates, Boolean algebra

➢ TIER-1: (UG-2):

Network Theory: RL, RC, RLC circuits, A.C. & D.C. Network Theorems , D.C. transient analysis, A.C. resonance, Steady state analysis w.r.t A.C. circuits. Analog Electronics: Diode circuits: clipper, clamper, peak detector, Voltage multiplier, Rectifier, BJT (biasing), Operational amplifier circuits, Switched Capacitors. Digital Electronics: Logic gates, Boolean algebra, Multiplexer, Demultiplexer, Half-adder, Full-adder, Signals and Systems: Representation of continuous linear time invariant and its response, Applications of Fourier series & Fourier transform in circuit analysis, Fundamentals of Sampling.

➢ TIER-2:

Network Theory: RL, RC, RLC circuits, ac & dc network theorems, dc transient analysis, ac resonance, Steady state analysis w.r.t ac circuits. Analog Electronics: Analog passive & active filters, Switched capacitors, Advanced diode circuits, MOSFET and BJT amplifiers: biasing, Equivalent circuit, Oscillators & feedback amplifiers, Operational amplifier, Timer circuits. Digital Electronics: Combinational & sequential logic circuits, A/D and D/A converters, Logic gate implementation using CMOS circuits. Control Systems: Transfer function, Transient & steady-state analysis of linear time invariant systems, Stability analysis using Routh-Hurwitz & Nyquist criteria, Bode plots, Root loci. Signals and Systems: Representation of continuous linear time invariant and causal systems and its response, Applications of Fourier series & Fourier transform for continuous time signals, Laplace transform.

-Knowledge of the above topics will help in designing the circuit.

❖ NOTE:

The information regarding the FINALS will be provided separately to the qualifying teams after the PRELIMS result.

The decision of the judges in the all rounds will be absolute.