

CIRCUISTICS

Group 1

Eligibility: 1st year UG students only

Group 2

Eligibility: 2nd year UG students only

Group 3

Eligibility: 3rd & 4th year UG students only

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CATEGORY 1 : For First Year Students

1. No. of group members:

3 or 4 students should be there in a group.

2. Subjects to be known:

Circuit theory basics, Basic analog circuits using diodes, BJTS, FETS, Basic use of Operational Amplifiers(OPAMP), Basics of digital electronics using GATES, FLIP FLOPS.

You just need to know basic principles of the above mentioned devices. Detailed studies are **NOT** needed.

3. Eligible students:

Open to **ALL** departments.

4. Rounds:

We have **2 Prelims** rounds and **1 Final** round.

- **PRELIMS-**

- There will be **2** Prelims on two different days.
- Both of them will be **based on** pen and paper.
- Questions will be **MCQ** type.
- Time duration will be **45 minutes** for first prelim and **40 minutes** for the second one.
- The question paper has to be solved by the entire team together.
- **3** teams from Prelims-1 and **3** teams from Prelims-2 will be selected for **Final** round.
- Students who will not be able to attend Prelims-1 and also who will **NOT** be able to **Qualify** Prelims-1 may appear in Prelims-2.

- **FINAL-**

- Only **One** round will be held on a third day after two Prelims.
- A problem statement and required circuit elements will be provided. Students have to **design** a circuit on the basis of problem statement.
- Time duration will be **3 hours**.
- Winners will be decided by our special judges on the basis of time taken, no of circuit elements used, stability and reliability of the circuit etc. The best circuit will be chosen from an engineering point of view.
- First **3** teams will be awarded.

5. Fees:

Participation is **FREE** of cost.

6. Contacts:

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Category 2: For 2nd year students

1. Team Structure:

- Each team comprises of 3-4 second year UG students
- Target participants: Electrical, Electronics, Instrumentation

2. Rounds:

There will be two rounds:

PRELIMS:

- There will be two prelims held on two different days.
- Both prelims will be pen and paper rounds having objective questions.
- Time duration: 1 hour.
- 2 teams will qualify from prelims-1 and 4 teams will qualify from prelims-2.
- Teams not qualifying through prelims-1 can appear in prelims-2.
- MCQs will be given on: Circuit theory, Electronics, Sequential Logic, Signals & Systems, Instrumentation.

FINALS:

- A problem statement on digital electronics will be given. Participants will have to design a circuit on breadboard accordingly.
- Time duration: 3 hours.
- All components and datasheet will be provided.

3. Rules:

- No entry fees.
- 3 teams will be awarded in the final rounds based on progress made, time taken, apparent cost of circuit etc.
- The winners will be decided entirely by the judges.

4. Contacts:

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Category 3: For 3rd and 4th year students

1. Team Structure:

- Each team should comprise of 2-3 students belonging to 3rd or 4th year.
A team may comprise students of -
 - I. different departments
 - II. different colleges/universities
 - III. 3rd and 4th year combined
- Target participants: Electrical, Electronics, Instrumentation

2. Rounds:

There will be two rounds:

PRELIMS:

- There will be two prelims held on two different days.
- Total 5 teams will qualify to the final round. Number of teams qualifying from Prelim-1 and Prelim-2 will be decided by the judges.
- Questions will be given from the set topics listed below -
Circuit Theory, Electronics, Control Systems, Electrical Machines, Power Systems, Instrumentation, Digital Signal Processing, Probability and Statistics, Power Electronics.

PRELIM-1 :

- Prelim-1 will be a pen and paper round having **objective (MCQ)** questions.
- Time duration: 1 hour.
- Teams not qualifying through prelim-1 can appear in prelim-2.

PRELIM-2:

- Prelim-2 will be a pen and paper round having **subjective** questions.
- Teams who did not attempt Prelim-1 can appear for Prelim-2.
- Teams who did not qualify Prelim-1 can appear for Prelim-2.
- Time duration: 1 hour

FINAL:

- There will be two problems given. Problem-1 will be on Power Electronics. Problem-2 will be based on Digital Signal Processing. **At least one member of the team should know Python as the programming language.**
- Time duration: 4 hours.
- All components, datasheets and computers will be provided.
- IDE provided : Spyder

- Reference Links :
Numpy Guide <https://docs.scipy.org/doc/numpy/user/quickstart.html>
Matplotlib Guide <https://matplotlib.org/tutorials/introductory/pyplot.html>
- External libraries other than Numpy and Matplotlib will not be allowed.

3. Rules:

- No entry fees. Participants should report to the venue at least 15 mins before the Prelims and Final.
- Calculators used in semester examinations are allowed.
- Teams will be awarded points in the final rounds based on progress made, elegance of solution, time taken, apparent cost of circuit etc.
- Number of winners will be decided by the judges.
- The winners will be decided entirely by the judges.

4. Contacts:

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