

CITY COLLEGE
Internal Examination 2020
Physics (Hons.) CBCS Semester 4
Paper: CC-10 (Analog Systems and Applications)
Time: 2 Hours; Full Marks: 50

Group-A

*Answer any **five** questions from the following:*

[5×2=10]

1. (a) What is ripple factor?
- (b) What is C-filter circuit?
- (c) What is the basic principle of operations of field effect transistors?
- (d) What is the feedback in amplifiers?
- (e) What are the characteristics of an ideal and practical Op-Amp?
- (f) What is a differentiator circuit?

Group-B

*Answer any **five** questions from the following:*

[5×5=25]

2. (a) Draw the energy level diagrams of p and n type semiconductors. (b) What do you mean by conductivity and mobility? (c) What is static and dynamic resistance? [2+2+1]
3. (a) What is drift velocity? (b) Derive barrier potential and barrier width. (c) Discuss the mechanism of current flow in forward and reverse biased diode. [1+2+2]
4. (a) What is half-wave rectifier? (b) What is centre-tapped and bridge full-wave rectifiers? (c) What is Zener diode? [1+2+2]
5. (a) Discuss how a Zener diode regulates the voltage in a circuit? (b) What is the principle and structure of LED? [3+2]
6. (a) What are the characteristics of CE configurations? (b) Discuss active, cut off and saturated regions. (c) What is DC load line and Q-point. [1+3+1]

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7. (a) Discuss two-stage RC coupled amplifier circuit. (b) What is Barkhausen's criterion for self-sustained oscillations? [3+2]

Group-C

Answer any five questions from the following: [5×3=15]

8. Discuss the reverse characteristics of a Zener diode.
9. What are the load and line regulation of a Zener diode?
10. What are the static characteristics of a bipolar junction transistor in CB and CE configuration?
11. Discuss the frequency response of the BJT amplifier in CE mode.
12. What are the static characteristics of FET?
13. Discuss the Wien-bridge oscillator circuit for a given frequency using an Op-Amp.

Answer scripts must be emailed to sem4hcityphysics@gmail.com within 15 minutes of the end of the examination.