

# UG 3rd Semester Examination 2021

## PHYSICS

Course Code: PHY-G-CC-P-03

[PRACTICAL]

(Analog Systems and Applications)

Full Marks : 20

Time : 2 Hours

The figure in the right-hand margin indicates marks

Answer any five questions

(5×4=20)

1. How can the V-I characteristics of a PN junction diode or light emitting diode be studied?
2. How can the V-I characteristics of a Zener diode be studied? How is it used as a voltage regulator?
3. Describe an experimental technique to study the V-I and power curves of a solar cell. How can the maximum power and efficiency of the same be determined?
4. Describe an experiment to draw the characteristic curves of a bipolar junction transistor in CE configuration.
5. Describe experimental techniques to study the various biasing configurations of a bipolar junction transistor in class A operation.
6. Draw the circuit diagram of a CE transistor amplifier with a specific gain using voltage divider bias and explain its operation.
7. Describe an experiment to draw the frequency response of voltage gain of a RC coupled transistor amplifier.
8. Draw the circuit diagram of a Wein bridge oscillator of a given frequency using an op-amp and explain its working.
9. Draw the circuit diagram of a phase shift oscillator of specific frequency using bipolar junction transistor.
10. Describe the working principle of a Colpitts oscillator with a suitable circuit diagram.
11. Draw the circuit diagram of a digital to analog converter and explain its working principle.
12. How can an analog to digital converter integrated circuit (IC) be studied in the laboratory?
13. Draw the circuit diagram of an inverting amplifier for steady voltages of a specific gain with op-amp. Explain the working principle of the same.
14. Draw the circuit diagram of an inverting amplifier using op-amp to study its frequency response.
15. Draw the circuit diagram of a non-inverting amplifier using op-amp to study its frequency response.
16. How can a zero-crossing detector and comparator be studied in the laboratory?
17. How can two DC voltages be added with an op-amp in inverting and non-inverting mode?
18. Draw the circuit diagram of an op-amp as an integrator. Explain the working principle of the same.
19. Draw the circuit diagram of an op-amp as a differentiator. Explain the working principle of the same.
20. How can the characteristics of a bipolar junction transistor be studied in common base configuration?