

OCTOBER 2021

Time: Three hours

Maximum Marks: 75

- Note:
1. Answer ALL the questions in PART-A (1 mark each)
  2. Answer any ONE question from each unit in PART-B (3 marks each)
  3. Answer any ONE question from each unit in PART-C (10 marks each)
  4. The question paper contains TWO Pages

**PART-A** (1x10=10)

1. Define temperature and unit.
2. Define mean free path.
3. Define critical pressure.
4. Write the advantages of renewable energy.
5. Define refractive index of a medium.
6. Expand the acronym RADAR.
7. Define Resistivity.
8. State Faraday's laws of electrolysis.
9. What is doping?
10. What is an integrated circuit?

**PART-B** (3x5=15)

UNIT-I

11. Write any three properties of thermal radiation.
12. Derive the relation between pressure and kinetic energy of a gas.

UNIT-II

13. Explain adiabatic change.
14. Write a note on wind energy.

UNIT-III

15. Write the principle of laser and any three uses of laser.
16. What is an active remote sensing?

UNIT-IV

17. State Kirchoff's laws.
18. Derive the expression for effective capacitance when <sup>three</sup> capacitors are connected in series.

UNIT-V

19. Explain forward biasing.
20. Write any three advantages of common emitter configuration.

PART-C (10x5=50)

## UNIT-I

21. Derive an expression for the pressure of a gas on the basis of kinetic theory of gases.
22. Calculate the value of universal gas constant R from the equation  $PV=RT$ .

## UNIT-II

23. Describe Linde's process for the liquefaction of air.
24. Write a note on solar energy.

## UNIT-III

25. Describe the construction and working of ruby laser.
26. Explain the principle and working of RADAR with block diagram.

## UNIT-IV

27. Derive the condition for balancing the Wheatstone's bridge by using Kirchoff's laws.
28. Describe an experiment to determine the specific heat capacity of a liquid using Joule's calorimeter.

## UNIT-V

29. Explain the working of full-wave rectifier using PN junction diode.
30. Explain NAND and NOR gates with the help of their truth tables.

\*\*\*\*\*