UG–C–2297 BPHY–21X

U.G. DEGREE EXAMINATION – DECEMBER, 2023.

Physics

Second Year

HEAT AND THERMODYNAMICS

Time : 3 hours Maximum marks : 70

PART A — ($3 \times 3 = 9$ marks)

Answer any THREE questions out of Five questions in 100 words.

All questions carry equal marks.

1. What is specific heat of gas?

2. Explain the degrees of freedom.

3. Define zero - point energy.

4. State Wiedmann – Franz law.

5. Give any three applications of ideal gases.

PART B — ($3 \times 7 = 21$ marks)

Answer any THREE questions out of Five questions in 200 words.

All questions carry equal marks.

6. Describe the Mayer's relation for specific heat of a gases.

7. Discuss the Maxwell's law of equipartition of energy.

8. Explain the 3rd law of thermodynamics.

9. Explain the coefficient of thermal conductivity of bad conductor by Lee's disc.

10. Derive the Fermi – Dirac distribution law statistics.

PART C — ($4 \times 10 = 40$ marks)

Answer any FOUR questions out of Seven questions in 500 words.

All questions carry equal marks.

11. Discuss the Debye's theory for atomic specific heat of solids with different temperature.

12. Derive an expression for molecular velocity distribution by Maxwell and calculate the mean free path equation.

13. Explain the theory and derivation of Maxwell's thermos dynamical relation.

14. Derive the Stefan's constant by experimental method.

15. Describe the Maxwell – Boltzmann distribution law of statistics and calculate its energy equation.

16. Describe the Einstein's quantum theory for specific heat of solid with variation of temperature.

17. Explain with neat diagram of Bose – Einstein distribution law for gas molecule.

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Physics

Second Year

ELECTRICITY AND MAGNETISM

Time : 3 hours Maximum marks : 70

PART A — ($3 \times 3 = 9$ marks)

Answer any THREE questions out of Five questions in 100 words.

All questions carry equal marks.

1. State Coulomb's law.

2. Explain the Peltier and Thomson effect.

3. Discuss self-induction and mutual induction.

4. Define skin effect.

5. Explain the susceptibility of magnetism.

PART B — ($3 \times 7 = 21$ marks)

Answer any THREE questions out of Five questions in 200 words.

All questions carry equal marks.

6. Derive the mechanical force experienced by unit area of a charged conductor.

7. Explain the thermodynamics of thermocouple with thermoelectric diagrams.

8. Explain the self-inductance of a coil by Raleigh's method.

9. Sketch with neat circuit of series resonance circuit with voltage angle.

10. Discuss the B-H curve by energy loss due to the hysteresis with its importance.

PART C — ($4 \times 10 = 40$ marks)

Answer any FOUR questions out of Seven questions in 500 words.

All questions carry equal marks.

11. Discuss the electrical potential at a point due to a uniformly charged conducting non-conducting sphere.

12. Derive the Joule – Thomson coefficient by the thermoelectric diagram.

13. Describe with necessary diagram of charge and discharge of a capacitor through resister.

14. Discuss with neat circuit of parallel resonance circuit and calculate the impedance at resonance.

15. Explain the Langerin's theory of para magnetism and discuss its cases.

16. Deduce the Coulomb's inverse square law from Gauss's law and find the relation between electrical field and electric potential.

17. Explain the growth and decay of current containing in LR circuit and find the time constant.

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