U.G. DEGREE EXAMINATION — JULY 2022.

Physics

(From CY – 2020 onwards)

Second Year

HEAT AND THERMODYNAMICS

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

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

All questions carry equal marks.

1. Explain why a gas possesses two specific heat capacities.

2. Define conduction and diffusion based on the transport phenomenon.

3. State Carnot's theorem.

4. Define coefficient of thermal conductivity. Mention its unit.

5. What is meant by statistical equilibrium?

PART B — (3 × 7 = 21 marks)

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

All questions carry equal marks.

6. State and explain Dulong and Petit's law.

7. Explain the law of equipartition of energy.

8. Prove that the change in entropy in a reversible process is zero.

9. Deduce Newton's law of cooling from Stefan's law.

10. Discuss the postulates of quantum statistics.

PART C — (4 × 10 = 40 marks)

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

All questions carry equal marks.

11. Describe Regnault's experiment to determine the specific heat capacity of a gas at constant pressure.

12. Write an essay on the application of equipartition energy by explaining the specific heat capacity of gases of monoatomic, diatomic and triatomic molecules.

13. Explain the concept of entropy of a perfect gas. Describe Temperature-Entropy diagram too.

14. Describe the experimental method of determining Stefan's constant with the necessary theory.

15. Distinguish between Maxwell-Boltzman statistics, Fermi-Dirac statistics and Bose-Einstein statistics.

16. Explain in detail the Debye theory of specific heat capacity of solids.

17. Describe the method of determining the thermal conductivity using the principle of radial flow of heat.

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Physics

(From CY – 2020 onwards)

Second Year

ELECTRICITY AND MAGNETISM

Time : 3 hours   Maximum marks : 70

PART A — (3 × 3 = 9 marks)

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

All questions carry equal marks.

1. What are the limitations of Coulomb's law?

2. Define seebeck effect.

3. What is electromagnetic induction? Give an example too.

4. What is meant by skin effect?

5. Define permeability and susceptibility.

PART B — (3 × 7 = 21 marks)

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

All questions carry equal marks.

6. Deduce Coulomb's law from Gauss law in electrostatics.

7. What is thermos electric power diagram? Mention two applications of it.

8. List out Faradays law of electromagnetic induction.

9. Differentiate between series and parallel resonance circuit.

10. What is hysteresis curve? What are the importance of hysteresis curves.

PART C — (4 × 10 = 40 marks)

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

All questions carry equal marks.

11. Calculate the electric potential due to a uniformly charged conducting spheres.

12. Experimentally verify seebeck effect using Carey Foster's bridge.

13. Give the experimental determination of mutual inductance.

14. Bring out the characteristics of series resonant circuit.

15. Explain, in your words, the dia, para and ferro magnetic materials with examples.

16. Derive the relation between peltier and Thomson Coefficient by applying thermodynamics of a Thermocouple.

17. Describe the energy loss due to hysteresis and discuss the importance of hysteresis curves.

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U.G. DEGREE EXAMINATION – JULY 2022.

Physics

(From CY – 2020 Onwards)

Second Year

GENERAL CHEMISTRY

Time : 3 hours   Maximum marks : 70

SECTION A — (3 × 3 = 9 marks)

Answer any THREE questions out of five question in 100 words.

All questions carry equal marks.

1. Write the difference between molality and molarity?

2. What is a polymerization reaction? Give an example.

3. What is vulcanization?

4. Write about the use of penicillin in the health sector.

5. What is the greenhouse effect? Write the impact of the greenhouse effect on global warming.

SECTION B — (3 × 7 = 21 marks)

Answer any THREE questions out of five question
in 200 words.

All questions carry equal marks.

6. How metallic and hydrogen bonds are formed.
    Explain with suitable examples.

7. What is reduced pressure distillation? Explain
    with a suitable diagram.

8. Explain addition and condensation polymerization
    reactions with examples.

9. What are reproductive hormones? Give examples
    and their role in the biological system

10. What are the general precautions that shall be
    taken to avoid lab accidents?

SECTION C — (4 × 10 = 40 marks)

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

All questions carry equal marks.

11. Explain the following with a suitable example.

    (a) Covalent boning

    (b) Co-ordinate bond

    (c) Metallic bond

12. Write the basic principle and application of paper chromatography.

13. Write the preparation applications of the following:

    (a) Polythene

    (b) Polystyrene

    (c) Teflon

14. What is enzyme catalysis? Write Michaelis Menton-lock and key theory.

15. Write the anyone synthesis of D-Glucose.

16. Explain the following:

    (a) acid rain

    (b) inorganic pollutants

    (c) organic pollutants

    (d) radioactive pollution

17. Write possible good practices to keep a laboratory safety and hygienic.

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