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Name:

Reg.No:

SECOND SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2024

(CBCSS)

CC20 PHY2 IC02 - PROPERTIES OF MATTER, THERMODYNAMICS, WAVES AND
OSCILLATION, ELECTRICITY AND MAGNETISM, COMPUTATIONAL PHYSICS

(Physics)

(2020 to 2022 Admissions - Supplementary/Improvement)

Time : 2.5 Hours

Maximum : 80 Marks

Credit: 4

Part A (Short answer questions)

Answer *all* questions. Each question carries 2 marks.

1. What is meant by a elastic limit?
2. What is a cantilever?
3. Write down the expression for Poiseuille's equation? Identify the terms in the equation.
4. Define the following 1. open sysytem, 2. closed system, 3. isolated system with examples.
5. What is the principle of refrigerator?
6. Explain the change in entropy during reversible and irreversible process.
7. Give Clausius Clapeyorn equation. Explain the terms.
8. Write down the expression for kinetic energy of particle executing SHM.
9. What is meant by damped oscillations? Obtain an expression for its motion.
10. Define electrical potential at a point in an electric field. What is its unit.
11. State and Explain Gauss's law.
12. How can we compare the magnetic moments using Searle's vibration magnetometer?
13. What are the major defects of assembly language?
14. What are the advantages and unique features of python language?
15. How to add a new item into a python set?

(Ceiling: 25 Marks)

Part B (Paragraph questions)

Answer *all* questions. Each question carries 5 marks.

16. Explain about the factors affecting surface tension of liquid.

17. Calculate the terminal velocity of an air bubble of radius 2×10^{-5} m rising in water of viscosity 0.8×10^{-3} Ns/m². Density of water = 10^3 kg/m³ and $g=9.8$ m/s². Neglect the density of air in comparison to that of water.
18. Calculate the work done when one gram molecule of an ideal gas expands isothermally at 27°C to double its original volume. $R=8.3$ J/Kmole.
19. Derive an expression for plane progressive harmonic wave.
20. Derive the relation between relative permeability and magnetic susceptibility.
21. What is meant by a variable in python? Explain rules for variable names.
22. What is the use of 'while' statement in python programming? Explain with example.
23. How to input from a file and output to a file in a program? Explain with example.

(Ceiling: 35 Marks)

Part C (Essay questions)

Answer any *two* questions. Each question carries 10 marks.

24. Derive the expression for the time period of a Torsion Pendulum and explain how it is used to find the rigidity modulus of the material of the wire.
25. State and prove Carnot's theorem. Give different statements of second law of thermodynamics.
26. Explain the terms capacitor and capacitance. Name and unit of capacitance. Obtain the expression for the capacitance of a parallel plate capacitor.
27. What is meant by formatted printing in python? Explain with examples.

(2 × 10 = 20 Marks)
