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Name:

Reg.No:

SECOND SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2025

(CBCSS)

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

(Physics)

(2020 to 2022 Admissions - Supplementary)

Time : 2.5 Hours

Maximum : 80 Marks

Credit: 4

Part A (Short answer questions)

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

1. What are elastic constants?
2. Define the terms neutral surface and neutral axis.
3. How does temperature affects the viscosity of liquid?
4. Explain isothermal and isochoric process.
5. Explain the significance of first law of thermodynamics.
6. What is the principle of refrigerator?
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. A body has a charge of 1C. Calculate the number of excess electrons on the body.
11. Derive the relation between magnetic elements of earth.
12. What is the resultant magenetic field of earth at a place where angle of dip is 60 degree and horizontal intensity is 0.3G?
13. What is the meaning of syntax rule in computer programming?
14. Write the general syntax of print command.
15. How to find largest number in a python list?

(Ceiling: 25 Marks)

Part B (Paragraph questions)

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

16. Derive the work done in twisting a cylinder.
17. Obtain the expression for the work done in blowing a bubble.

18. Efficiency of a Carnot's cycle changes from $1/6$ to $1/3$ when source temperature is raised by 100K . Calculate the temperature of the sink.
19. Show that $\sin \omega t + \cos \omega t$ represents a periodic function.
20. Derive an expression for the capacitance of a spherical capacitor.
21. What are the advantages and unique features of python language over other programming languages?
22. What is meant by a variable in python? Explain rules for variable names.
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. Explain the method of Poiseuille's method for determining coefficient of viscosity.
25. Explain the change in entropy during reversible and irreversible cycle. Explain the concept of entropy and disorder
26. Discuss the motion of particle under damped motion and obtain its differential equation. Write the probable solution and represent it graphically.
27. Explain different collection data types (list, tuple, set, dictionary) with examples.

(2 × 10 = 20 Marks)
