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Name:

Reg.No:

SECOND SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2026

(CBCSS)

**CC20PHY2IC02 - 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 is elastic after effect?
2. Differentiate between a streamline flow and a turbulent flow of a liquid.
3. Explain adiabatic process with indicator diagram.
4. Give any two statements of second law of thermodynamics.
5. Define the term entropy. Give its unit.
6. What is simple harmonic motion? Obtain an expression for displacement of the particle.
7. What is meant by damped oscillations? Obtain an expression for its motion.
8. Distinguish between transverse and longitudinal waves with suitable examples.
9. Define 1 Volt.
10. Define 1 farad.
11. What is magnetic mapping?
12. Define reduction factor of TG. How does the sensitivity of TG depend on its reduction factor?
13. Differentiate between interactive and script mode in python.
14. How to add a new item into a python set?
15. What is a tuple in python? How to create them?

(Ceiling: 25 Marks)

Part B (Paragraph questions)

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

16. Calculate the couple required to twist one end of a wire of length 1 m and radius 1.5 mm through an angle 45 degree by keeping the other end fixed given $n = 5 \times 10^{10} \text{ Nm}^{-2}$

17. A plate of metal $0.5 \times 10^{-2} \text{ m}^2$ area rests on a layer of castor oil $4 \times 10^{-3} \text{ m}$ thick, whose coefficient of viscosity is 1.55 Ns/m^2 . Calculate the tangential force required to move the plate with a uniform speed of $4 \times 10^{-2} \text{ m/s}$. Repeat the calculation for benzene, whose coefficient of viscosity is half of castor oil.
18. A tyre pumped to a pressure of 3atm suddenly bursts. Calculate the fall in temperature due to adiabatic expansion. Initial temperature is 27°C . $\gamma = 1.4$
19. Calculate the change in entropy of 5Kg water at 100°C when it changes into vapour.
20. Calculate under what pressure ice freezes at 272K if the change in specific volume when 1Kg of water freezes is $91 \times 10^{-6} \text{ m}^3$. Latent heat of ice $3.36 \times 10^5 \text{ J/Kg}$.
21. Show that a charged soap bubble shows a small increase in size.
22. Explain number formatting in print command with examples.
23. How to define functions in python? Define a function to find square of a number received as input from user?

(Ceiling: 35 Marks)

Part C (Essay questions)

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

24. What is meant by cantilever? Derive the expression of the cantilever loaded at free end, when the weight of the cantilever is negligible.
25. What are the factors affecting surface tension? How does curvature of a liquid surface affect evaporation?
26. Explain steps involved in writing and execution of a computer program with an example.
27. Explain different string operations in python with examples.

(2 × 10 = 20 Marks)
