21I208 (Pages: 2) Name: .....

Reg.No: .....

SECOND SEMESTER M.Sc. INTEGRATED GEOLOGY DEGREE EXAMINATION, APRIL 2022

(CBCSS)

(Regular/Supplementary/Improvement)

CC20I PHY2I G01 - PROPERTIES OF MATTER, THERMODYNAMICS, WAVES AND OSCILLATION, ELECTRICITY AND MAGNETISM, COMPUTATIONAL PHYSICS

(Physics)

(2020 Admission onwards)

Time : 2.5 Hours Maximum : 80 Weightage

Credit : 4

Part A (Short answer questions)

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

1. What are the drawbacks of torsion pendulum?
2. Write down the expressions for geometrical moment of inertia of beams of rectangular and circular cross sections.
3. Differentiate between cohesive force and adhesive force?
4. Explain adiabtic process with indicator diagram.
5. State Carnot's theorem.
6. Explain the change in entroy in a carnot cycle.
7. Mention the name of thermodynamic process involved in carnot engine.
8. Write down the expression for kinetic energy of particle executing SHM.
9. Obtain the general equation of a wave motion.
10. State Gauss's Law.
11. What are dielectrics? Distinguish between a polar and a non polar dielectrics.
12. Give properties of ferromagnetic substances.
13. What is an algorithm in a computer program?
14. What is the function used to read input from user? Write an example.

15. What is the use of 'break' and 'continue' statements in python programming ?

(Ceiling: 25 Marks)

Part B (Paragraph questions)

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

16. Derive the expression for the work done in the case of longitudnal strain?

17. Stoke's method can't be used to determine the viscosity of water, explain.

18. A quantity of air (Y=1.4) at 27 degree celsius is compressed suddenly to 1/4th of its volume. Find final temperature.

19. For a damped oscillator, the mass m of the block is 200g, force constant=10N/m and the damping constant is 40g/S. Calculate the period of oscillation if oscillatory.

20. Three charges q, 2q, and 3q are to be placed on 9 cm long staight line. Find the position where the charges should be placed such that the potential energy of the system is mimimum.

21. What are the advantages and unique features of python language over other programming languages?

22. Explain different string operations in python.

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. Write Clausius-Clayperon equation. Explain the effect of pressure on the boiling point of liquids and melting point of liquids on the basis of this equation.

25. Explain Carnot engine and its working. Derive the equation for efficeincy of Carnot engine.

26. (a) Explain the theory of vibration magnetometer. With the help of Searle's vibration magnetometer, how can we find the magnetic moment of a bar magnet?
    (b) How can we compare earth's horizontal magnetic fields at different places using Searle's vibration magnetometer?

27. Explain different list operations in python with examples.

(2 × 10 = 20 Marks)

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