INTEGRATED MSC DEGREE EXAMINATION, FEBRUARY 2024

First Semester

INTEGRATED MSC BASIC SCIENCE-CHEMISTRY

Complementary - ICH1CM06 - PHYSICS I -PROPERTIES OF MATTER AND SEMICONDUCTING MATERIALS

2020 Admission Onwards

89A8E723

Time: 3 Hours   Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Why the girders are manufacture in the form of letter I?

2. What is meant by torsional oscillation?

3. What is meant by isothermal process?

4. Write the expression for excess pressure of a liquid.Obtain the expression for excess pressure inside a bubble in a liquid.

5. What is meant by turbulent flow of liquid?

6. What are the assumptions of Poiseuille to arrive Poiseuille's formula?

7. What are the assumptions of stokes formula?

8. Distinguish between intrinsic semi-conductors and extrinsic semi-conductors.

9. What is ripple factor? What is its value for a half wave and full wave rectifier?

10. Draw the circuit diagram of a typical dc power supply.

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11.   Calculate the workdone in starching a wire of length 1 m and cross-section 1 mm^2 through 1 mm. Young's modulus of the material is 200 GPa.

12. Obtain the relation for bending of beams.

13.   A light metal rod of a length 80 cm and diameter 5 cm is firmly clamped at one end and loaded with 3 kg at the free end. What is the depression at the free end? Given Y=190 GPa.

14. Determine the loss of energy when 27 droplets of water ,each of radius 0.6 mm, coalesce to form a single drop. Given surface tension of water =0.072 N/m.

15. Explain Newton's law of viscous flw of liquid.

16. Discuss the behaviour of a pn junction under reverse biasing.

17. Calculate the inductance of a series inductor filter connected to a full wave rectifier working on a 50 Hz supply to produce an output voltage across a 500Ω load with a a minimum ripple of 0.08.

18. Explain the term current amplification factor(α) . A transistor has α = 0.98. If the emitter current of the transistor is 2 mA, determine its base current and gain factor β.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. What are the different types of strain? Determine the workdone per unit volume when a body undergoes linear,volume and shear strain,respectively.

20. Obtain the expression for depression of a rectangular crossection of uniform bending.

21. Explain molecular theory of surface tension.Show that surface tension is equal to workdone in increasing the surface area of liquid film by unit area.

22. What is meant by rectification process? With a circuit diagram describe the action of a full wave bridge rectifier. Compare its merits over that of a centre tap full wave rectifier.

(2×5=10 weightage)