



Date: 02-11-2018

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

Part-A

Answer ALL questions.

(10 × 2= 20)

1. List 2D Bravais lattices in crystallography.
2. Draw the crystalline planes in cubic unit cell having miller indices (1 1 0) and (0 1 1).
3. Define nucleus in crystal growth.
4. What is known as inelastic behaviour ?
5. Write a note on stiffness of a material.
6. What are F centres? Give an example.
7. How are ferroelectric materials used in ultrasound machines?
8. Write the principle of solution polymerization.
9. How is polyurethane prepared?
10. What are metal matrix composites? Give an example.

Part-B

Answer any EIGHT questions.

(8 × 5= 40)

11. List all the 32 point groups in crystallography.
12. Explain single crystal x-ray diffractometer.
13. Define Screw axis and enumerate all the unique screw axes.
14. Describe the Zockralski method of crystal growth.
15. Discuss the various types of micro hardness test.
16. Write a note on photoluminescence, electroluminescence and cathode luminescence.
17. Write short notes on the storage of magnetic data using magnets.
18. Explain the significance of photogalvanic effect for the generation of hydrogen.
19. How is processing of polymers carried out by injection moulding? Explain.
20. Discuss the mechanism of the preparation of polypropylene using Zeigler-Natta polymerization.
21. What are core-shell nanoparticles? Explain any two types.
22. Explain the thermal degradation of polymers with suitable examples.

Part-C

Answer any FOUR questions.

(4 × 10= 40)

23. Discuss the 3D bravais lattice with suitable examples and diagrams.
24. Explain the function of SEM with a neat diagram.
25. Describe the atomic model of elastic behavior of the material and discuss the elastic properties of elements in periodic table.
26. Why does ferromagnet show spontaneous magnetization? Explain.
27. Write short notes on
 - a) piezoelectric effect
 - b) mechanism of rubber oxidation
28. Explain the synthesis of nanomaterials by
 - a) Laser ablation
 - b) sol-gel method.

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