M.Sc. DEGREE EXAMINATION,NOVEMBER 2019
II Year III Semester
Crystal Physics

Time : 3 Hours **Max.marks :75**

Section A $(10 \times 2 = 20)$ Marks

Answer any **TEN** questions

1. Define the term nucleation.
2. Distinguish between the homogeneous and heterogeneous nucleation.
3. Define supersolubility.
4. What is meant by liquid phase epitaxy?
5. Compare the powder XRD with the single crystal XRD.
6. Outline the advantages of FTIR and UV visible studies.
7. Define reciprocal lattice. Give its use.
8. State Bragg's law.
9. What do you mean by electronegativity?
10. Define the terms: bond order and bond energy.
11. Mention the Various method involved in crystallization.
12. Define supersaturation.

Section B $(5 \times 5 = 25)$ Marks

Answer any **FIVE** questions

13. Explain in brief about the following crystal growth phenomena: Cap shaped nucleus and disc shaped nucleus.
14. Write a short note on molecular beam epitaxy.
15. Explain the thermal gravimetric analysis technique (TGA).
16. Give a brief account on win GX software for structure determination and visualization.
17. Discuss the different types of bonding in solids.
18. Write the notes on various types of gel and structure of gel.
19. Explain growth from melt using the Bridgeman technique.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. (i)Deduce and discuss the Gibbs-Thomson equation for vapour growth.
(ii)Write a note on energy of formation of a nucleus.
21. State the principle and working of
(i) Vapour phase epitaxy, (ii) liquid phase epitaxy.
22. Discuss the microhardness studies with a neat sketch.
23. Explain the the principle, construction amd working of X-ray diffractometer with a neat diagram.
24. Give a detailed account on: (i) Conformation of molecules, (ii) Five membered and six membered rings, and (iii) Packing of molecules.

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