M.Sc DEGREE EXAMINATION,APRIL 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. What is nucleation?
2. Differentiate between homogeneous and heterogeneous nucleation.
3. What do you mean by supersolubility?
4. List the advantages of gel growth technique.
5. Give the principle of FTIR.
6. What is microhardness?
7. How Bragg's law is interpreted in identifying the structure of a crystal?
8. Define reciprocal lattice.
9. Define bond angle and bond length.
10. What are the differences between primary and secondary bonds?
11. State the disadvantages of liquid phase epitaxy technique.
12. Distinguish between cap and disc shaped nucleus.

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

Answer any **FIVE** questions

13. Give a detailed account on atmospheric nucleation.
14. Explain in detail the Bridgeman method of growing single crystals with necessary diagrams.
15. Discuss the principle and working of UV- visible spectrometer.
16. Enumerate the steps involved in crystal structure determination.
17. Obtain the packing factors for hcp structure.
18. Explain the structure of gel.
19. Calculate the energy of formation of a cylindrical nucleus.

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

Answer any **THREE** questions

20. Derive Gibbs Thomson equation for vapour.
21. With neat diagram, describe the vapour epitaxy method of crystal growth.
22. Describe the power XRD technique for crystal characterization.
23. Discuss the basis of automation of crystal structure analysis. Explain WinGX software for crystal structure determination.
24. Write an essay on ionic, covalent and metallic bonds by explaining the formation and properties with suitable examples.

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