PPH/CE/3003

M.SC. DEGREE EXAMINATION,APRIL 2018
II YEAR - III SEMESTER
Core Elective-III - CRYSTAL PHYSICS

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

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

Answer any **TEN** questions

1. What are the factors influencing nucleation?
2. What is spherical nucleus? When is it formed?
3. Write the relation between saturation and supersaturation.
4. Why slow cooling method is advantageous than slow evaporation method?
5. Give the principle of gel growth.
6. What is the characteristic wavenumber region of FTIR spectra?
7. What are the main features of etching study?
8. How will you identify melting point of a sample using thermal characterization?
9. What are reciprocal lattice vectors?
10. State Braggs law for X-ray diffraction.
11. What you mean by packing of molecules?
12. Define bond energy.

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

Answer any **FIVE** questions

13. Explain homogeneous and heterogeneous nucleation.
14. Describe about temperature gradient method of crystal growth.
15. Discuss the principle and apparatus of molecular beam epitaxy.
16. Explain powder X-ray diffraction using De-bye Shirer formula.
17. Describe the principle and interpretation of a UV-Visible spectrum.

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18. Explain the construction of single crystal X-ray diffractometer.

19. Outline the conformation of five membered and six membered ring molecules.

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

Answer any **THREE** questions

20. Discuss energy of formation of a nucleus and obtain the Gibbs Thomson equation for the same.

21. Explain the principle of melt growth and explain the growth of single crystals from melt using Bridgman technique.

22. Describe the various tests on microhardness and explain the measurement of hardness number using Vikers test.

23. Discuss the steps in crystal structure determination by single X-ray diffraction.

24. Explain the formation and characteristic features of ionic, Vanderwalls and Hydrogen bonds.