

ATAL BIHARI VAJPAYEE VISHWAVIDYALAYA BILASPUR (C.G.)
Pre Ph. D. Course work Examination 2019-20

PHYSICS

PAPER II: CW – 02 (Synthesis and Characterization of Materials)

Model question paper

[Set – II]

Duration - 3.00 Hrs

Max. Marks - 80

Note: Section - A is Compulsory. Answer one question from each unit of Section - 'B' carrying equal marks

Section - A

1. Answer the following questions in brief. 2 X 10 = 20

- i. What do you mean by the term Crystallisation?
- ii. What is the principle behind steam distillation?
- iii. What are the several parameters that influencing the reaction mechanism of combustion method?
- iv. Write the principle of Molecular Beam Epitaxy technique (MBE)?
- v. What do you mean by AFM?
- vi. What are the various possible applications of FTIR spectroscopy?
- vii. Explain the different types of radiation and their sources.
- viii. Write the basic dosimetric quantities.
- ix. Write the basics of assembler based approach of K. Eric Drexler about nanotechnology.
- x. What is the importance of large surface to volume (S/V) ratio in nanostructure?

Section - B

12 X 5 = 60

UNIT – I

2. What do you mean by Distillation? Describe its different types in details.

3. How the crystal is grown by Bridgeman Method? Explain.

UNIT – II

4. Describe sputtering deposition technique of depositing thin films. Give its advantages and drawbacks.

5. What is chemical vapour deposition technique (CVD)? Classify various CVD techniques.

UNIT – III

6. Give the Schematic diagram of a SEM and discuss its working. What is its most common or standard deflection mode?

7. Discuss the working principle of XRD. Also mention its application, strength and limitation.

UNIT – IV

8. Discuss the biological effects of non-ionizing radiation?

9. What do you mean by radiation? Explain its types and sources of radiation.

UNIT – V

10. What do you mean by nanotechnology? Briefly describe about history of nanotechnology.

11. What is quantum confinement? Explain in details.

====