

**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**

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

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**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 defection 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.**

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