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 – I]

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. Why purification of starting materials required before synthesis of a sample?
ii. What factors control the size and purity of a single crystal?
iii. How is the thin film defined?
iv. Write any four desired features of phosphors.
v. Write basic principle of XRD.
vi. Write basic principle of ESR.
vii. What are the main sources of environmental radiations?
viii. What do you mean by absorbed dose? Define Gray (Gy).
ix. How surface area to volume ratio varies from large particles to nanoparticle?
x. What are the advantages of ball milling method in nanotechnology?

.

Section - B **12 X 5 = 60**

UNIT – I

1. What are different methods for detection of impurities in a sample? Explain any one of them.

2. What are different methods for growth of a single crystal? Explain Czochralski method.

UNIT – II

3. Give general idea of preparation of a thin film by sputtering.

4. Explain different steps of solid state reaction method for synthesis of phosphors

UNIT – III

5. Describe basic principle and working of TEM using suitable diagrams.

6. Discuss applications of photoluminescence.

UNIT – IV

7. Discuss in brief the different physical effects which may take place when high energy radiation interacts with matter.

8. Write a note on biological effects of ionizing radiations.

UNIT – V

9. Discuss importance of nanotechnology in different areas.

10. What are different methods for synthesis of nano materials? Explain combustion synthesis.

===*===**