

M.Sc.(Phy.) Semester - 3 (CBCS) Examination
Oct/Nov-2022 (NEW COURSE)
Synthesis of Materials (Elective (New))

Time: 2:30 Hours

Marks: 70

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q - 1: Answer in brief any SEVEN

14

- (a) Which sites are occupied by Al^{3+} ions in Alumina and $MgAl_2O_4$?
- (b) What is Conduction Heating ?
- (c) What are “sol” and “gel” in sol-gel method ?
- (d) What is the usefulness of co-precipitation method ?
- (e) What is CSD method ?
- (f) What is “Pulsed Laser” ?
- (g) Draw the arrangement of atoms in monocrystalline and multi crystalline material.
- (h) Generally, how crystals are obtained ?
- (i) Based on transport of crystal constituents, how will you classify crystal growth ?
- (j) What is homo and hetero epitaxy ?

Q - 2: Answer the following questions: Any TWO out of THREE

14

- (a) What is “Solid State Reaction” ? Explain Wagner Reaction Mechanism.
- (b) Discuss the experimental procedure of Ceramic Method with special reference to “Mixing” and “Container Material”.
- (c) Explain the Microwave Synthesis Method by taking a suitable example of High- T_c Superconducting Compound.

Q - 3: Answer the following questions: ALL ARE COMPULSORY

14

- (a) Discuss the synthesis of Doped Tin Dioxide using Sol-Gel method ?
- (b) Explain: Co-precipitation as a precursor to Solid State Reaction.

OR

Q – 3: Answer the following questions: ALL ARE COMPULSORY

- (a) Name the processes to obtain crystals by vapor method and discuss sublimation.
- (b) Draw the diagram of autoclave. Discuss its types and about protective inserts used to prevent it from corrosion.

Q - 4: Answer the following questions: Any TWO out of THREE

14

- (a) With necessary figure, discuss Czochralski method of crystal growth.
- (b) Discuss: Flame Fusion Method of crystal growth with figure.
- (c) With diagram discuss Bridgeman method of crystal growth .

Q - 5: Write any TWO short-notes :

14

- (a) Sputtering Method
- (b) Pulsed Laser Deposition method
- (c) Spin Coating Method
- (d) Molten Flux Method
