

M.Sc.(Phy.) Semester - 3 (CBCS) Examination
Oct/Nov-2021 (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.

Que.1 Answer in brief any SEVEN (14)

1. Which sites are occupied by Al^{+3} ions in Al_2O_3 and $MgAl_2O_4$?
2. Who governs how efficiently the absorbed microwave radiation is converted to heat?
3. Explain the words “sol” and “gel” in sol-gel method.
4. What is co-precipitation?
5. What is vacuum evaporation?
6. What is sputtering?
7. What do you mean by sublimation?
8. What is solid to solid phase transformation?
9. What are the different techniques of crystal growth from melt?
10. What is hydrothermal method of crystal growth?

Que.2 Answer the following questions: Any TWO out of THREE (14)

1. What is ceramic method? Explain Wagner Reaction Mechanism in details.
2. Discuss the experimental procedure of SSR method with special reference to reagents and mixing.
3. Explain microwave synthesis method by taking a suitable example of high T_c superconducting compound.

Que.3 Answer the following questions: (14)

- (a) How $LiNbO_3$ is synthesized using sol-gel method? Explain in detail.
- (b) Explain the synthesis of $La_{0.7}Sr_{0.3}MnO_3$ using co-precipitation method.

OR

Que.3 Answer the following questions:

- (a) Explain the Czochralski method of crystal growth with figure.
- (b) Explain the Bridgeman method of crystal growth with figure.

Que.4 Answer the following questions: Any TWO out of THREE (14)

1. Discuss: Verneuil method of crystal growth.
2. Discuss Pull Rate, Rotation Rate and Thermal Gradients in Czochralski method of crystal growth
3. Discuss the Hydrothermal method of crystal growth.

Que.5 Write any TWO short notes (14)

1. Spin coating
2. PLD method
3. Sputtering method
4. Zone Melting Technique
