



APRIL/MAY 2019

MPH341 CRYSTAL GROWTH AND THIN FILMS

Time : Three hours

Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

1. (a) Explain the different kinds of nucleation process.

Or

- (b) Describe the induction period and the metastable zone width of nucleation.

2. (a) Describe the slow cooling and slow evaporation methods to grow crystals.

Or

- (b) Discuss the experimental procedure of gel growth technique by chemical reaction.

3. (a) Explain Verneuil process of growing crystals from melt.

Or

- (b) Describe the skull melting process with basic diagram.
4. (a) Explain the preparation of transparent conducting oxides by spray pyrolysis.

Or

- (b) Describe resistive heating and Flash evaporation experiments.
5. (a) What is powder X-ray diffraction pattern? And explain how you will interpret and X-ray pattern.

Or

- (b) Define chemical etching and explain the procedure for obtaining etch pits in crystal surface.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. Discuss in detail the growth kinetics of thin films and the properties of thin film structures.
7. Explain the phenomenon solubility, saturation and supersaturation for low temperature solution growth. Also describe the working of a constant temperature bath.

8. Describe the procedure of growing single crystals by Bridgman technique with diagram.
9. Discuss the following.
- (a) Physical vapour deposition
- (b) Chemical vapour deposition
10. Describe the mechanical behaviour of crystalline material using vicker's microhardness test with theory.

