

NOVEMBER/DECEMBER 2019

**MPH34A — CRYSTAL GROWTH AND
THIN FILM**

Time : Three hours

Maximum : 75 marks

SECTION A — (5 × 6 = 30 marks)

Answer ALL questions.

1. (a) Explain the kinetics of Nucleation and discuss about metastable zone width.

Or

- (b) Describe the characteristics of thin film structure.

2. (a) Using Mier's TC diagram explain saturation and supersaturation. Also derive the relation between them.

Or

- (b) Describe the construction and working of constant temperature bath.



3. (a) Discuss the temperature gradient method of high temperature growth.

Or

- (b) Explain the principle and working of verneuil method.
4. (a) Describe the classification of vacuum and explain its production.

Or

- (b) Explain the preparation and properties of conducting oxides.
5. (a) Discuss the elemental analysis using EDAX spectrum.

Or

- (b) Describe the principle and working of SEM.

SECTION B — (3 × 15 = 45 marks)

Answer any THREE questions.

6. Discuss in detail the KVS theory of nucleation and obtain the expression for Gibb's free energy.
7. Explain the principle, experimental procedure and various types, of gel growth technique.

8. With neat experimental diagram discuss the method of growing crystal by Czochralski technique.

9. Explain the following:

- (a) Resistive heating
(b) Electron gun
(c) Chemical vapour deposition.

10. Discuss in detail about dielectric characterization. Also describe the measurement of dielectric constant and dielectric loss and explain their variation with frequencies.

