

III Semester Examination, January 2022**M.Sc.****CHEMISTRY****Paper III****(Solid State and Polymer Chemistry)**

Time : 3 Hours]

[Max. Marks : 80

Note : *All questions are compulsory. Question Paper comprises of 3 Sections. Section A is objective type/multiple choice questions with no internal choice. Section B is short answer type with internal choice. Section C is long answer type with internal choice.*

SECTION A**1×8=8****(Objective Type/Multiple Choice Questions)***Choose the correct answer :*

1. Which of the following defects is also known as dislocation defects ?
- (a) Frenkel
 - (b) Schottky
 - (c) Non-stoichiometric
 - (d) Simple interstitial

P.T.O.

2. To get *n*-type doped semiconductor the impurity to be added to silicon should have the following number of valence electron ?
- (a) 1
 - (b) 2
 - (c) 3
 - (d) 5
3. Basic source of magnetism :
- (a) Charged particle alone
 - (b) Movement of charged particle
 - (c) Magnetic dipoles
 - (d) Magnetic domains
4. Example for magnetic materials used in data storage devices.
- (a) CrO₂
 - (b) Alnico
 - (c) Cunife
 - (d) None of these
5. The word polymer meant for material made from :
- (a) Single entity
 - (b) Two entities
 - (c) Multiple entities
 - (d) Any entity
6. One of characteristic properties of polymer material.
- (a) High temperature stability

[3]

- (b) High mechanical strength
 - (c) High elongation
 - (d) Low hardness
7. Strong covalent bond exists between polymer chains in :
- (a) Thermoplasts (b) Thermosets
 - (c) Elastomers (d) All polymer
8. Elastic deformation in polymer due to :
- (a) Slight adjust of molecular chains
 - (b) Slippage of molecular chains
 - (c) Straightening of molecular chains
 - (d) Severe of covalent bonds

SECTION B

6×4=24

(Short Answer Type Questions)

Note : Answer the following questions in **250** words.

Unit-I

1. Explain intrinsic and extrinsic defects with examples.

Or

Explain photoelectric effect.

G-3/361/22

P.T.O.

[4]

Unit-II

2. Explain electrically conducting solids with suitable examples.

Or

Write note on new super conductors.

Unit-III

3. Discuss electrically conducting fire resistant.

Or

Explain chain configuration of macromolecules.

Unit-IV

4. Explain glass transition temperature (T_g) and crystalline melting point (T_m).

Or

Discuss morphology and order in crystalline polymers.

SECTION C

12×4=48

(Long Answer Type Questions)

Note : Answer the following questions in **500** words.

Unit-I

1. Describe the thermodynamics of schottky and frenkel defects.

G-3/361/22

[5]

Or

Discuss the following :

- (a) Optical properties of solids.
- (b) Band theory of solids.

Unit-II

2. Discuss the following :

- (a) Quantum theory of paramagnetic co-operative phenomena.
- (b) Write short note on charge transfer complex.

Or

Discuss the following :

- (a) Kinetics of solid state reactions.
- (b) Write short note on organic metals.

Unit-III

3. Discuss the kinetics and mechanism of polymerisation.

Or

Discuss the determination of molar masses of macromolecules by viscometry.

[6]

Unit-IV

4. Describe the crystal structure of polymers, morphology of crystalline polymers, strain induced morphology.

Or

Discuss the polymer structure and physical properties of polymers.

☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆☆