

2056
Bachelor of Science (FYUP)-Fourth Semester
Chemistry
Paper: Concepts in Chemistry - 2

Time allowed: 3 Hours

Max. Marks: 67

NOTE: Attempt four questions in all, including Question No. 7 (Unit-IV) which is compulsory and selecting one question each from Unit I - III.

x-x-x

UNIT - I

1. Answer the following:-
- Explain oxidation-reduction reactions using electronic and oxidation number concepts.
 - Balance: $\text{MnO}_4^- + \text{Fe}^{2+} \rightarrow \text{Mn}^{2+} + \text{Fe}^{3+}$ (oxidation number method).
 - Explain the use of redox potential data in analysing redox cycles.
 - Discuss significance of Frost diagrams in determining redox stability in water. (4x4)
2. a) Explain Ellingham diagrams for reduction of metal oxides using carbon and CO.
b) Describe Van Arkel-de Boer process and Mond process.
c) Explain zone refining method. (6,6,4)

UNIT - II

3. a) Discuss basic characteristics of polymers.
b) Explain molecular weight and molecular weight distribution.
c) Define glass transition temperature and explain its significance. (4,6,6)
4. a) Explain free radical polymerisation with mechanism.
b) Describe Ziegler-Natta polymerisation.
c) Discuss natural rubber and synthetic rubber with examples. (4,6,6)

UNIT - III

5. a) Describe theories of liquid state.
b) Explain structural differences between solids, liquids and gases.
c) Explain liquid crystals and nematic phase. (6,4,6)
6. a) Define colloids and classify them.
b) Explain Hardy-Schulze rule and gold number.
c) Explain types and preparation of emulsions. (4,6,6)

UNIT - IV

7. Part A: MCQ
1. Oxidation involves:
- | | |
|----------------------|----------------------|
| a) Gain of electrons | b) Loss of electrons |
| c) Gain of protons | d) Loss of neutrons |

Contd.....P/2



(2)

2. Latimer diagrams represent:
 - a) Oxidation states and reduction potentials
 - b) Rate of reaction
 - c) Geometry
 - d) Bond energies
3. Hydrometallurgy involves extraction using:
 - a) Molten salts
 - b) Aqueous solutions
 - c) Gas
 - d) Solid carbon
4. Temperature where polymer becomes flexible:
 - a) Boiling point
 - b) Melting point
 - c) Glass transition temperature
 - d) Critical temp
5. Ring opening polymerisation occurs in:
 - a) Cyclic monomers
 - b) Aromatics
 - c) Alkanes
 - d) Aldehydes
6. Layered liquid crystal phase:
 - a) Nematic
 - b) Smectic
 - c) Cholesteric
 - d) Cubic
7. Tyndall effect is due to:
 - a) Scattering of light
 - b) Viscosity
 - c) Density
 - d) Surface tension
8. Rule relating coagulation power with ion valency:
 - a) Hardy-Schulze rule
 - b) Henry law
 - c) Raoult law
 - d) Hess law
9. In gels dispersion medium is usually:
 - a) Gas
 - b) Liquid
 - c) Solid
 - d) Plasma

(9×1)

Part B: Short Answers

1. Define Pourbaix diagram.
2. What is electrolytic reduction?
3. Define condensation polymerisation.
4. What is cholesteric liquid crystal phase?
5. Define protective colloid.

(5×2)

x-x-x