

2022
M.Sc.
Fourth Semester
DISCIPLINE SPECIFIC ELECTIVE – 03
CHEMISTRY
Course Code: MCHD 4.11 (A)
(Applied Inorganic Chemistry)

Total Mark: 70
Time: 3 hours

Pass Mark: 28

Answer five questions, taking one from each unit.

UNIT-I

1. (a) What are inorganic polymers? Give the classification of inorganic polymers with example. 1+4=5
- (b) Discuss briefly the mechanical properties of inorganic polymers citing the curves for typical polymeric materials. 5
- (c) Explain the characterization of inorganic polymers with respect to molecular weights. 4

2. (a) Differentiate between organic and inorganic polymers. 3
- (b) Discuss the importance of crystallinity in a polymer. 5
- (c) Write notes on the following: 3×2=6
 - (i) Solubility consideration
 - (ii) Chain statistic

UNIT-II

3. (a) Draw the structures of the following: 2×3=6
 - (i) Pendant polyphosphazene
 - (ii) Cycloliner
 - (iii) Cyclomatrix
- (b) Discuss ring opening polymerization (ROP). 4
- (c) Explain surface reactions of polyphosphazene with two examples. 4

4. (a) Give the applications of polyphosphazenes. 6
(b) Discuss condensation polymerization (CP). 4
(c) Write short notes on small molecule models. 4

UNIT-III

5. (a) Explain the synthesis of silver nanoparticles by photochemical method. 5
(b) What is lithography? Explain extreme ultraviolet lithography with help of diagram. 1+5=6
(c) Write short notes on the application of nanoparticles in next generation computer chips. 3
6. (a) Discuss the classification of nanomaterials. 3
(b) Explain how you would synthesis Pt nanoparticles by using plants. 6
(c) Give an account on the application of nanoparticles in vivo imaging. 5

UNIT-IV

7. (a) Discuss the detection and measurement of radioactivity. 4
(b) Write short notes on the following: 3×2=6
(i) Radiopharmaceutical
(ii) Radiometric titration
(c) Give the application of radioisotopes as tracers in chemical analysis. 4
8. (a) Give the differences between nuclear fission and nuclear fusion. 4
(b) White short notes on the following: 3×2=6
(i) Isotope dilution technique
(ii) Radiochemical principle in the use of tracers
(c) Explain the cause of radioactivity. 4

UNIT-V

9. (a) How are soils classified? Explain any one of the soil type. 2+3=5

- (b) Write short notes on the following: $2 \times 2 = 4$
- (i) Soil colloids
 - (ii) Buffering soil
- (c) What are fertilizers? Discuss the ill effects of using fertilizers. $2 + 3 = 5$
10. (a) Discuss the various properties of soil. 4
- (b) Write short notes on the following: $2\frac{1}{2} \times 2 = 5$
- (i) Green manure
 - (ii) Compost
- (c) What are desert soils? Define fungicides with an example. $3 + 2 = 5$
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