

Five Year Integrated M. Sc. Examination 2022

Semester-VII

Course: CH-4-7-5

(Chemistry)

Time: Three Hours

Full Marks: 40

Questions are of value as indicated in the margin

Group-A

(Answer *any five* questions)

1. (a) What is the semi -synthetic polymer? Discuss with suitable examples. 2 x 5 = 10
- (b) What is theta temperature of a polymer? What is the free energy change at theta temperature?
- (c) Define the term “the degree of polymerization”. What will be the molar mass of the polymer if the mass of the monomer is “m” g.
- (d) If the temperature of a polymer is increased or decreased, what type of thermal transition you may expect? Write in details about these thermal transitions.
- (e) Classify polymers based on their thermal response. Mention the names.
- (f) Define number average and weight average molecular weight of a polymer.

Group-B

(Answer *any six* questions)

2. (a) Define co-polymers with suitable example. 2+3
- (b) Write the general considerations for a particular monomer to be converted into the polymer.
3. (a) What are plasticizers? 1+4
- (b) Write in brief the uses, benefits and drawbacks of two important plasticizers.
4. (a) Define flexible polymers. 1+4
- (b) Derive the expression of the end-to-end distance of a flexible polymer.
5. (a) What is ionic polymerization? 1+3+1
- (b) Discuss about the different kinetic steps of the anionic polymerization.
- (c) Why polymers synthesized by anionic polymer are known as living polymer?
6. Define T_m and T_g of polymers and indicate how they are affected by chemical structure. 2 + 3
7. Write a brief notes on “Block and Graft co-polymers”. 5
8. Discuss about the different important quantities that characterizes the stress-strain behavior of a polymer. 5