

[A-81]

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Sardar Patel University

B.Sc. Sixth Semester, Industrial Chemistry Vocational

Friday, 01/04/2016

Time: 02:30 pm to 05:30 pm

US06CICV03, Polymer Science

Total Marks: 70

Q-1 Answer the following MCQ'S:

(10)

- I. Functionality of phenol is \_\_\_\_  
a. Three                      b. One                      c. Two                      d. Four
- II. Which one is thermoplastic polymer?  
a. Polyethylene              b. Epoxy resin              c. Urea formaldehyde      d. Phenol formaldehyde
- III. Usually \_\_\_\_ molecules give linear polymer.  
a. Monovalent              b. Bivalent              c. Trivalent              d. Tetravalent
- IV. The number average molecular mass of polymer is written as.....  
a. Mn                      b. Mv                      c. Mw                      d. Both b & c
- V. Glass transition temperature is denoted by \_\_\_\_  
a. Tg                      b. Mg                      c. Gt                      d. Tm
- VI. How many isomers of dihydroxy diphenyl methane are based on pH of the medium.  
a. 1                      b. 3                      c. 2                      d. 4
- VII. Reaction between diisocyanates and polyol produce \_\_\_\_  
a. Phenol-formaldehyde      b. Polyurethane              c. Phenolic              d. all of these
- VIII. What is the phenol formaldehyde ratio for produced novalak?  
a. 1:1.4                      b. 1:0.8                      c. 8:1                      d. 1:1
- IX. Fawcett & Gibson synthesized \_\_\_\_  
a. Butadiene                      b. Polyethylene              c. Styrene                      d. LABS
- X. Nylon are \_\_\_\_  
a. Polyamide                      b. Poly urethane              c. Epoxy                      d. None of these

Q-2 Answer the following short question (Any Ten)

(20)

- I. Define Monomer and Repeating unit.
- II. Give the historical perspective of polymers.
- III. Enlist schematically classification of polymer.
- IV. What is glass transition temperature?
- V. Enlist & express the methods of average molecular weight.
- VI. Explain the term crystallizability.
- VII. Which are the commonly used isocyanate and polyol for polyurethanes?
- VIII. Draw the flow diagram of PF-novalak resin.
- IX. How the phenol is prepared.
- X. Give the chemical reaction by which styrene monomer can be prepared.
- XI. Compare the properties of LDPE & HDPE.
- XII. Enlist the various methods for polyethylene synthesis.

- Q-3 a. Give the classification of polymer based on thermal response. (05)  
b. Classify polymers based on molecular arrangement. (05)

OR

- Q-3 a. Write the mechanism of addition polymerization. (05)  
b. Write note on Initiators. (05)
- Q-4 a. Explain the generalization concept of number average and weight average molecular weight. (05)  
b. Explain the relationship between glass transition temperature and melting point. (05)

OR

- Q-4 a. Explain in detail the end group analysis method. (05)  
b. Why the glass transition temperature of polyethylene is lower than nylon-6? (05)
- Q-5 a. Explain the process of manufacturing phenol formaldehyde resol resin. (05)  
b. Give the important properties & uses of phenol formaldehyde resin. (05)

OR

- Q-5 a. Describe the process of manufacturing polyurethane. (05)  
b. Give the important properties & uses of melamine formaldehyde resin. (05)
- Q-6 Write the detail note on polyethylene. (10)

OR

- Q-6 Write the detail note on polypropylene. (10)

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(2)