

**B.Sc. (Part—III) Semester—V Examination****5S : PETROCHEMICAL SCIENCE**

Time : Three Hours]

[Maximum Marks : 80

- Note :—** (1) Question No. 1 is compulsory and carries 8 marks.  
(2) The remaining **SIX** questions carry 12 marks each.  
(3) Draw a diagram and chemical equation wherever necessary.

1. (a) Fill in the blanks :

- (i) The molecular weight of large polymer depends on their number of \_\_\_\_\_ present in that polymer.
- (ii) Diene polymer comprises known as \_\_\_\_\_.
- (iii) \_\_\_\_\_ enhance the crystallisability of wax without dissolving oil.
- (iv) The chain of \_\_\_\_\_ consist of only one type of monomer units. 2

(b) Choose correct alternatives :

- (i) Polyisoprene is well known \_\_\_\_\_ polymer.
  - (a) Plastics (b) Rubber
  - (c) Fiber (d) All above
- (ii) In suspension polymerization process \_\_\_\_\_ play an important role for removal of heat.
  - (a) Air (b) Salt
  - (c) Water (d) Caustic
- (iii) High pressure polyethylene manufacturing process was developed by \_\_\_\_\_.
  - (a) ICI (b) TCS
  - (c) MDCC (d) UDP
- (iv) Polyvinyl acetate is mainly used in \_\_\_\_\_.
  - (a) Cement (b) Paint
  - (c) Bitumen (d) None of these 2

(c) Answer in **one** sentence each :

- (i) Which are three distinct stages of chain polymerization ?
- (ii) Which two steps are involved in production of diisobutylene ?
- (iii) What is Polyimides ?
- (iv) What is the major drawback of polystyrene polymer ? 4

2. (A) Describe free radical chain polymerization with example. 6(B) Classify the polymers with the structure. 6**OR**

3. (P) Describe mass polymerization process in detail. 6  
(Q) What is Polymer ? Explain with type, monomers used and also explain degree of polymerization. 6
4. (A) How polypropylene are formed ? Describe all steps involved in polymerization of polypropylene and also give the uses of polypropylene. 6  
(B) Describe year-wise history of polyethylene production with respect to catalyst and process parameters involved. 6

**OR**

5. (P) Ethylene-propylene copolymers are formed in various mole range. How they are formed ? Describe with respect to process parameters. 6  
(Q) Describe Phillips medium pressure process for production of polyethylene with respect to process parameters and their uses. 6
6. (A) Describe dimerization of isobutylene with respect to their chemistry and process parameter in detail. 6  
(B) Describe Goodyear 5D process for production of isoprene monomer in detail. 6

**OR**

7. (P) How styrene-butadiene block copolymers are prepared ? Describe in detail. 6  
(Q) Describe production of polyisobutylene with respect to their chemistry and process parameters involved. 6
8. (A) Which are the styrene polymers and copolymer ? How we will produce polystyrene ? Give the techniques extensively followed in industry. 6  
(B) Vinyl chloride is a monomer of PVC. Describe PVC production with respect to physical properties of monomer and also give the uses of PVC. 6

**OR**

9. (P) Describe the following with their market : 4  
(i) Impact polystyrene 4  
(ii) Vinyl chloride – vinyl acetate copolymer 4  
(iii) Polystyrene. 4
10. (A) What is Polyesters ? Describe saturated polyester with their chemistry and process parameters involved. 8  
(B) Describe the chemistry and process parameters for production of nylon-6, 10. 4

**OR**

11. (P) Describe the production of phenolic thermosetting resin with their chemistry and process parameters. 6  
(Q) What is nylon ? Give their example and describe production of Nylon-66 with their chemistry and process parameters involved. 6
12. (A) Describe both processes for manufacture of calcium grease. 6  
(B) What is the principle involved in solvent dewaxing ? Describe Barisol process in detail. 6

**OR**

13. (P) Give the uses of following : 3  
(i) Wax 3  
(ii) Bitumen. 3  
(Q) What is bitumen ? Which tests and properties are prescribed for bitumen ? Discuss any one of them. 6