6. (A) Describe the production of butyl rubber with the chemistry involved. Also mention the process parameters. 6

(B) Explain the production of polyisoprene with the chemistry involved. 6

OR

7. (a) Describe the dimerization process of isobutylene with the chemistry and process parameters involved. 6

(b) Discuss in brief the production of di-isobutylene with the chemistry and process parameters involved. 6

8. Polyvinyl chloride is the most widely used large tonnage thermoplastic polymer. Discuss the production of PVC with neat sketch of flow diagram and process parameters involved. 12

OR

9. Discuss the production of polystyrene in detail with neat sketch of flow diagram and process parameters involved. Mention the uses of polystyrene. 12

AR – 584

Fifth Semester B. Sc. (Part – III) Examination

5S : PETROCHEMICAL SCIENCE

P. Pages : 6

Time : Three Hours] [Max. Marks : 80

Note : (1) Question No.**One** is compulsory.
(2) Discuss the reactions, mechanisms wherever necessary.
(3) Diagrams and chemical equations should be given wherever necessary.
(4) Illustrate your answers with the help of neat sketches wherever necessary.

1. (A) Fill in the blanks :—

(i) The phenomena of autocatalyst is known as ———.

(ii) Greater flexibility in chain means —— to deformation from applied stresses.

(iii) MEK used in dewaxing process stands for ———.

(iv) The molecular weight of the step polymer is ——— to the percent conversion.

$4 \times \frac{1}{2} = 2$

(B) Choose correct alternative :—

(i) These polymers cannot be recycled —.

(a) Thermoplastics (b) Thermosets

(c) Elastomers (d) All of above.

(ii) In suspension polymerization process monomer is dispersed in water in the form of fine droplets of the order of —— μm in diameter

(a) 0.15 to 5 (b) 0.20 to 5

(c) 1.15 to 5 (d) 0.15 to 7

(iii) Butyl rubber is essentially a polyisobutylene containing only 1-3% ——.

(a) Polyisoprene (b) polyneoprene

(c) Sulfur (d) polyvinyl chloride.

(iv) Di–isobutylene is manufactured in two steps, one —— and second is dimerization

(a) Distillation (b) Extraction

(c) Desorption (d) Absorption.

$4 \times \frac{1}{2} = 2$

(C) Answer the following questions in **one** sentence.

(i) What do you mean by 6,6 –salt ?

(ii) Why wax does not crystallize during chilling ?

(iii) What is degree of polymerization ?

(iv) Which are the three stages of chain polymerization ? $4 \times 1 = 4$

2. (A) How polymers are formed ? 6

(B) Describe radical polymerization in detail. 6

OR

3 (P) What do you mean by homopolymer ? Mention any two examples. 4

(Q) Describe free radical polymerization with the mechanism involved. 8

4. Discuss the production of polyethylene by Zeigler process in detail with neat sketch of flow diagram and process parameters involved. 12

OR

5. Discuss the production of polypropylene in detail with neat sketech of flow diagram and process parameters involved. 12

10. (A) Mention the specific gravity and melting points of the following :—

(i) Polyester

(ii) Nylon 6.6.

(iii) PVC

(iv) HDPE 4

(B) How saturated polyesters formed ? Explain with raw material, reaction involved, and operating conditions. Also mention its uses. 8

OR

11. (P) Mention the uses of Nylon and Resins. 4

(Q) Discuss the production of polyethylene terephthalate with the chemistry and process parameters involved. 8

12. (A) What is the source of wax ? Mention the important properties of wax. 4

(B) Discuss the bitumen blowing process with the neat sketch of flow diagram. 8

OR

13. (p) Mention the various uses of wax. 4

(q) Explain the significance of ductility test for bitumen. 4

(r) What are the various applications of bitumen ? 4