## B.Sc. (Part-III) Semester-V Examination

## 5S : PETROCHEMICAL SCIENCE

Time : Three Hours] [Maximum Marks : 80

**Note :**—(i) Question No. **1** is compulsory and carries **8** marks.

(ii) Remaining **SIX** questions carry **12** marks each.

(iii) Draw diagram and chemical equation wherever necessary.

1. (A) Fill in the blanks : 2

(i) Medium pressure process for polyethylene was developed by Phillips based on _____ catalyst.

(ii) _____ is a generic name for synthetic polymides.

(iii) In suspension polymerization _____ plays an important role in removing heat of polymerization efficiently and economically.

(iv) The reacting monomers in copolymer are called as _____.

(B) Choose the correct alternative : 2

(i) The melting point of nylon 6, 10 is :

(a) 265°C (b) 115°C

(c) 215°C (d) 165°C

(ii) Resol resin is formed with _____ formaldehyde phenol ratio.

(a) High (b) Low

(c) Medium (d) All above

(iii) Acrylonitrile butadiene copolymers are random copolymers which usually contain _____ acrylonitrile.

(a) 25-45 wt % (b) 25-75 wt %

(c) 20-35 wt % (d) 95-5 wt %

(iv) Polymerization reactions are _____.

(a) Endothermic (b) Exothermic

(c) (a) and (b) (d) Natural

(C) Answer in one sentence each : 4

(i) What is the greatest limitation of bulk polymerization ?

(ii) Which steps are involved in chain polymerization ?

(iii) Which are the raw materials for nylon 6, 6 ?

(iv) What is copolymers ?

2. (A) Describe the following :

(i) Stereopolymers-synthesis, composition and properties. 6

(ii) Thermoplastics and thermosets-classification with examples. 6

**OR**

3. (P) Describe condensation polymers with their example. 6

(Q) What is polymer ? Give the example with their monomer and also explain degree of polymerization. 6

4. (A) Describe the history of polyethylene manufacture development. 6

(B) How polypropylene are formed ? Discuss in detail. 6

**OR**

5. (P) Discuss the ethylene-propylene copolymers with their process parameter. 6

(Q) Describe Phillips medium pressure process for production of polyethylene with respect to their process parameter. 6

6. (A) Which are the copolymers of butadiene ? Explain any one of them. 6

(B) 2, 4, 4 trimethyl pentene 1 and 2, 4,4-trimethyl pentene-2 manufacture from dimerization of isobutylene- how this is possible ? Discuss in detail. 6

**OR**

7. (P) Discuss the following polymers :

(i) Polyisoprene 3

(ii) Polychloroprene. 3

(Q) How will you manufacture butyl rubber ? 6

8. (A) How polymers of styrene get importance ? Discuss mass polymerization for production of polystyrene. 6

(B) Describe impact polystyrene in detail with respect to their chemistry. 6

**OR**

9. (P) Which are the styrene copolymers ? Explain ABS polymer in detail. 8

(Q) Discuss the market of following :

(i) Polystyrene 2

(ii) Polyvinyl chloride. 2

10. (A) What is poly esters ? Describe poly ethylene terephthalate production with respect to their chemistry and process parameter. 8

(B) Which are the monomers of following nylons ? Give their structure, melting point and density :

(i) Nylon-6 2

(ii) Nylon-11. 2

**OR**

11. (P) Describe urea-formaldehyde resin production with respect to their chemistry. 6

(Q) Which are condensation polymers ? Describe nylons and polyesters with example. 6

12. (A) Describe the uses of the following :

(i) Bitumen 4

(ii) Wax. 4

(B) In which test properties ring on ball used ? Discuss in detail. 4

**OR**

13. (P) Describe petroleum wax with their properties. 6

(Q) Ductility test property used for bitumene—how we will calculate this test ? 6