13. (P) Describe Lummus ammoxidation process for manufacture of Terepthalic acid with their chemistry. 6

(Q) Describe market of following in detail :

(i) Phthalic Anhydride

(ii) Terepthalic Acid. 6

AQ–699A

B.Sc. Part–II (Semester–IV) Examination

4S : PETROCHEMICAL SCIENCE

Time—Three Hours] [Maximum Marks—80

Note :— (1) Question No. 1 is compulsory.

(2) All **SIX** questions carry equal marks.

(3) Diagrams and chemical equation should be given wherever necessary.

(4) Discuss the reaction mechanism wherever necessary.

1. (A) Fill in the blanks :

(i) Ethylene glycol is obtained by _____ of ethylene oxide.

(ii) Calanese Corp. USA developed process of oxidation of _____ to obtain ancitic anhydride required for VAM.

(iii) _____ is used as a monomer for acrylic and modacrylic fibers, various resins and rubber.

(iv) Phenol production through cumene route gives _____ as a main by-product. 2

(B) Choose correct alternative :

(i) Direct hydration process for production of isopropyl alcohol was developed by _____.

(a) BASF Germany (b) RCF India

(c) ICI (UK) (d) None of these

(ii) Three steps involved in isoprene production through Goodyear S.D. process :

(1) Dimerization

(2) Isomerization

(3) _____.

(a) Pyrolysis (b) Hydration

(c) Dehydrogenation (d) Polymerization

(iii) Catalyst used in Acetaldehyde Wacker Process is :

(a) $CuCl_2$ and V_2O_5 (b) $CuCl_2$ and $PdCl_2$

(c) $CuCl_2$ and IO_2 (d) $CuCl_2$ and H_2SO_4

(iv) Aniline may be produced by the _____ of Phenol.

(a) Ammionolysis (b) Hydration

(c) Dehydrogenation (d) Sulphonation 2

9. (P) Adipic acid is an important chemical in polymer industries. Describe production of adipic acid through cyclohexane. 6

(Q) Discuss dehydrogenation of t-Amylenes for production of isoprene with the catalyst, chemistry and process parameters. 6

10. (A) Describe aniline production through ammonolysis process with the process parameters and chemistry involved. 6

(B) In which route acetone has been produced as a by-product while manufacture of Phenol ? Explain this route in detail with the chemistry. 6

OR

11. (P) Which is main feed-stock for production of Caprolactum ? Explain Du-Pont process with the chemistry and process parameters. 6

(Q) Describe liquid phase and vapour phase nitration process for production of aniline with the chemistry and process parameters involved. 6

12. (A) Describe the process of production of phthalic anhydride through O-Xylene with their advantages. 6

(B) Explain chemistry and process parameter for production of Di-methyl Terepthalete by using P-Xylene. 6

OR

(C) Answer in **one** sentence :

(i) Why propylene cannot be easily oxidized to propylene oxide ?

(ii) Name any three routes for production of isoprene.

(iii) What are the applications of Acetaldehyde ?

(iv) What are the disadvantages of hydroperoxidation process for production of propylene oxide through cumene ? 4

2. (A) Explain oxichlorination process with their advantages, process parameter, chemistry and catalyst involved. 6

(B) Describe production of acetaldehyde by using catalyst $CuCl_2$ and $PdCl_2$ in detail. 6

OR

3. (P) What are the various raw material utilised in production of Vinyl acetate monomer ? Explain Celanese Process with the chemistry involved. 6

(Q) Describe Union Carbide Process for production of Ethyl alcohol with its chemistry. 6

4. (A) Compare direct oxidation and chlorohydrin process with the advantages and disadvantages for production of ethylene oxide. 6

(B) Explain hydrolysis of ethylene oxide with the chemistry and process parameters. 6

OR

5. (P) Discuss chemistry and process parameter of chlorohydrin, process for production of ethylene oxide. Also state uses of ethylene oxide. 6

(Q) Describe uses, chemistry and process parameter for production of ethnol amines through ethylene oxide. 6

6. (A) Explain hydroperoxidation process for production of propylene oxide with the chemistry and process parameters. 6

(B) Describe acrylamide manufacture through hydration process involving chemistry and process parameters. 6

OR

7. (P) Describe acetone manufacture through isopropyl, alcohol including their chemistry, process parameters and uses. 6

(Q) Describe catalytic hydration process for production of isopropyl alcohol with the chemistry, process parameters and uses. 6

8. (A) Describe process for manufacture of chloroprene through butadiene with the chemistry and process parameters. Why is its gaining importance ? 6

(B) Describe and explain oligomerization process for production of isoprene with the chemistry and process parameters. 6

OR