AU–133

B.Sc. Part—III Semester—V Examination

INDUSTRIAL CHEMISTRY (R/V)

(Chemical Process Economics, Heavy and Fine Chemicals)

Time : Three Hours] [Maximum Marks : 80

Note :–(1) Question No. 1 is compulsory and carries 8 marks.

(2) Remaining all six questions carry 12 marks each.

(3) Give chemical equations and draw diagrams wherever necessary.

(4) Use of calculator is allowed.

1. (A) Fill in the blanks :— 2

(i) The raw materials for the production of silicon carbide are _____.

(ii) Ethylene oxide and ammonia are the raw materials used in the production of _____.

(iii) Depreciation caused due to wear and tear is called as _____ depreciation.

(iv) Solid carbon dioxide is also known as _____.

(B) Choose the correct alternative :— 2

(i) The number of days assumed in a normal year to determine simple interest in exact way is :

(a) 360 (b) 365

(c) 340 (d) 355

(ii) The catalyst used in the hydrogenation of vegetable oil is :

(a) Iron (b) Chromium

(c) Copper (d) Nickel

(iii) A vapor will not burn till the concentration of oxygen in air is below :

(a) 8% (b) 10%

(c) 12% (d) 14%

(iv) The long form of 'Trem cards' in concern of chemical safety is :

(a) Transit Emergency Cards (b) Transfer Emergency Cards

(c) Transport Emergency Cards (d) Travel Emergency Cards

(C) Answer in **ONE** sentence :— 4

(i) What is interest ?

(ii) Define saponification value.

(iii) What is the effect of a toxic chemical on blood in our body ?

(iv) What is break even point ?

UNIT—I

2. (A) Draw a flow sheet diagram for the manufacture of ammonium nitrate and explain it with consumption pattern and raw materials. 6

(B) Discuss the manufacture of Caustic Soda with flowchart and give its raw materials and consumption pattern. 6

OR

3. (P) Explain the manufacture of chlorine with respect to raw materials, consumption pattern and flow sheet diagram. 6

(Q) With the help of flowchart explain the manufacture of ammonium phosphate. Give its consumption pattern and raw materials. 6

UNIT—II

4. (A) Draw the flow sheet diagram for the manufacture of Soda ash by Solvey process and explain it. 4

(B) Explain the manufacture of Calcium Carbide with flowchart. 4

(C) Give the raw materials and consumption pattern for urea and discuss any two engineering problems associated with its manufacture. 4

OR

5. (P) Give an account of manufacture of lime with flow sheet diagram. 4

(Q) Discuss the manufacture process of sulfuric acid with flowchart. 4

(R) Draw and explain the manufacture of silicon carbide. 4

UNIT—III

6. (A) Explain the hydrogenation of vegetable oil with dry process. 4

(B) Give an account of :—

(i) Expression method for extraction of essential oils.

(ii) Acid value. 4

(C) Give the uses of following essential oils :—

(i) Citral

(ii) Camphor. 4

OR

7. (P) Describe the recovery of glycerine during the manufacture of soap. 4

(Q) Explain refining of vegetable oil. 4

(R) Discuss the manufacture of soyabean oil by solvent extraction method. 4

UNIT—IV

8. (A) Discuss the manufacture of acetylene with its flowchart. 4

(B) Draw and explain the manufacture of Vinyl chloride via ethylene dichloride pyrolysis. 4

(C) Give the process description for the production of ethanolamines. 4

OR

9. (P) Give an account of Fischer Tropsch synthesis. 4

(Q) Give the consumption pattern, raw materials and major engineering problems with respect to isopropanol production. 4

(R) Describe chlorination of methane. 4

UNIT—V

10. (A) Explain the liquification of carbon dioxide and give the uses of carbon dioxide. 6

(B) Discuss any six points in concern with hazards and their control in petrochemical industry. 6

OR

11. (P) Describe the manufacture process of oxygen and nitrogen. 6

(Q) Explain the hazards associated with the storage, handling and use of following types of chemicals :

(i) Explosive

(ii) Flammable/combustible

(iii) Toxic. 6

UNIT—VI

12. (A) Explain the following factors affecting investment and production cost :

(i) Government Policies

(ii) Source of equipments. 4

(B) Discuss straight line method for determination of depreciation. 4

(C) Give an account of nominal and effective interest rates. 4

OR

13. (P) Explain cash flow for industrial operation. 4

(Q) Discuss simple and compound interest with example. 4

(R) What is Profitability ? Explain discounted cash flow method for profitability evaluation. 4