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 :

(i) Molecular Formula of quick lime is ____ __.

(ii) Fire and _____ are the major hazards in petrochemical plants.

(iii) The compensation paid for the use of borrowed capital is called as _____.

(iv) Fischer-Tropsch synthesis produce liquid fuel and chemicals from _____.

2

(B) Choose correct alternatives :

(i) Lemongrass is source of _____ essential oil.

(a) Citral (b) Menthol

(c) Terpentine (d) Camphor

(ii) The Linde's method of oxygen and nitrogen manufacture involves the use of _ ___ effect.

(a) Kick (b) Joule-Thomson

(c) Newton (d) Bonds

(iii) In production of sulfuric acid from sulfur _____ catalyst is used.

(a) Fe (b) V_2O_5

(c) Ni (d) None of these

(iv) Molecular formula of vinyl chloride is _____.

(a) $CH_2 = CHCl$ (b) $CH \equiv CHCl$

(c) $CHCl_3$ (d) CCl_4 2

(C) Answer in one sentence each :

(i) Give the uses of menthol.

(ii) What are industrial gases ?

(iii) Give any two products from chlorination of methane.

(iv) Define Salvage value. 4

UNIT–I

2. (a) Explain the manufacture process of nitric acid w.r.t. :

(i) Consumption pattern

(ii) Raw material

(iii) Major Engineering Problems. 6

(b) Describe the manufacture process of caustic soda w.r.t. :

(i) Consumption pattern

(ii) Raw material

(iii) Major Engineering problems. 6

OR

3. (p) Draw and explain manufacture process of Ammonia. 6

(q) Draw and explain manufacture process of chlorine. 6

UNIT–II

4. (a) Draw and explain the manufacture process of urea. 6

(b) Draw and explain the manufacture process of sulfuric acid. 6

OR

5. (p) Explain manufacture process of soda ash by Solvay process. 6

(q) Discuss manufacture process of calcium carbide. 6

UNIT–III

6. (a) Define essential oil. Explain the extraction of essential oil by solvent extraction. 4

(b) Discuss the saponification of oil. 4

(c) Describe hydrogenation of vegetable oil. 4

OR

7. (p) Explain the following terms :

(i) Acid value

(ii) Ester value. 4

(q) Describe the extraction of essential oil by steam distillation. 4

(r) Explain manufacture of soap. 4

UNIT–IV

8. (a) Draw and explain manufacture process of mono, di, triethanolamine with major engineering problems. 6

(b) Describe the chlorination of methane with major engineering problems. 6

OR

9. (p) Explain Fischer Tropsch synthesis with example. 6

(q) Draw and explain manufacture process of isopropanol. 6

UNIT–V

10. (a) Describe any six steps involved in risk management. 6

(b) Explain the manufacture of oxygen and nitrogen by Linde's method. 6

OR

11. (p) Give the accounts of following hazards :

(i) explosion

(ii) flames

(iii) toxicity. 6

(q) Discuss the manufacture of carbon dioxide by combustion method. 6

UNIT–VI

12. (a) What is simple interest ? Explain. 4

(b) Discuss rate of return method on profitability evaluation. 4

(c) Explain sum of the year digits method of depreciation. 4

OR

13. (p) Give an account of cash flow for industrial operation. 4

(q) Explain cumulative cash position. 4

(r) Describe nominal and effective interest rates. 4