AS–1452

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

(ii) Remaining all **six** questions carry 12 marks each.

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

(iv) Use of calculator is allowed.

1. (A) Fill in the blanks :

(i) Molecular formula of Hydrated lime is _____.

(ii) Nitrogen is used in the glass industry for making _____ glass.

(iii) In production of urea, undesired side reaction give undesired product as _____.

(iv) Fire and _____ are the major hazards in petrochemical plants. 2

(B) Choose correct alternative :

(i) Vinyl acetate monomer is used as an intermediate in manufacture of :

(a) Polyvinyl chloride (b) Polyvinyl acetate

(c) Polyvinyl butyryl (d) All of these

(ii) Molecular formula of urea is :

(a) NHCONH (b) NH_2CONH_2

(c) NH_2CONH (d) None of these

(iii) Citral essential oil is isolated by _____ of lemon grass oil.

(a) Steam distillation (b) Solvent extraction

(c) Expression (d) None of these

(iv) In economics, the time unit for simple interest is taken as _____ year.

(a) Two (b) Three

(c) One (d) Half 2

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

(i) Define acid value for oil.

(ii) What is rate of interest ?

(iii) What are industrial gases ?

(iv) Give the uses of Acetylene. 4

UNIT–I

2. (a) Explain the manufacture process of caustic soda w.r.t. :

(i) Consumption pattern

(ii) Raw material

(iii) Major Engineering Problems. 6

(b) Describe the manufacture process of nitric acid w.r.t. :

(i) Consumption pattern

(ii) Raw material

(iii) Major Engineering Problems. 6

OR

3. (p) Draw and explain the manufacture process of superphosphate and triple superphosphate. 6

(q) Explain the manufacture process of Ammonium Nitrate w.r.t. :

(i) Consumption pattern

(ii) Raw material and reaction

(iii) Major Engineering Problems. 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) Draw and explain manufacture process of Hydrochloric Acid. 6

(q) Draw and explain manufacture process of Sodium Carbonate. 6

UNIT–III

6. (a) Define Essential Oil. Give the uses of following essential oils :
   (i) Menthol
   (ii) Citral
   (iii) Camphor. 4
   (b) Explain the manufacture process of soyabean by solvent extraction. 4
   (c) Discuss the recovery of glycerine from soap industry. 4

OR

7. (p) Describe the following extraction methods of essential oils :
   (i) Solvent extraction
   (ii) Steam distillation. 4
   (q) Discuss cleaning action of soap. 4
   (r) Explain the saponification value of edible oil. 4

UNIT–IV

8. (a) Discuss the chlorination of methane with major engineering problems. 6
   (b) Explain Fischer Tropsch Synthesis with example. 6

OR

9. (p) Draw and explain manufacture process of mono, di, triethanolamine with major engineering problems. 6
   (q) Draw and explain manufacture of vinyl chloride. 6

UNIT–V

10. (a) Explain the manufacture of oxygen and nitrogen by Linde's method. 6
    (b) Give the accounts of the following hazards :
    (i) Explosion
    (ii) Flames
    (iii) Toxicity. 6

OR

11. (p) Explain the manufacture of carbon dioxide by Combustion method. 6
    (q) Discuss any six steps involved in Risk Management. 6

UNIT-VI

12. (a) Explain the Straight Line Method for Depreciation. 4
    (b) Discuss Cash Flow for Industrial Operation. 4
    (c) Explain Cumulative Cash Position. 4

OR

13. (p) Discuss the factors affecting Investment and Production Cost. 4
    (q) Describe nominal and effective interest rates. 4
    (r) Explain sum of the year digits method of depreciation. 4