

B.Sc. (Part-III) Semester-VI Examination
INDUSTRIAL CHEMISTRY (R/V)
(Instrumental Methods of Chemical Analysis, Green Chemistry)

Time : Three Hours]

[Maximum Marks : 80

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

(2) Remaining questions carry 12 marks each.

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

(4) Use of scientific calculator is allowed.

1. (A) Fill in the blanks :

(i) The small quantity removed from the bulk for analysis is called _____.

(ii) Precision is defined as the degree of agreement between repeated measurement of _____ quantity.

(iii) In all chromatographic techniques, difference in affinity involves the process of either adsorption or _____.

 (iv) Anion exchangers are cross linked high molecular weight polymers containing _____ groups. 2

(B) Choose the correct alternatives :

(i) Paper chromatography is practically suitable for :

(a) Ion exchange

(b) Partition

(c) Adsorption

(d) Size exclusion

(ii) Picric acid is _____ coloured dye.

(a) Red

(b) Blue

(c) Black

(d) Yellow

(iii) Which of the following is not the basic component of X-ray fluorescence instrumentation ?

(a) Goniometer

(b) Column

(c) Collimator

(d) Diffracting crystal

(iv) In chromatography on stationary phase the substance gets :

(a) Reabsorbed

(b) Absorbed

(c) Adsorbed

 (d) None of these 2

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

(i) Define ion exchange capacity.

(ii) What is auxochrome ?

(iii) Define sampling.

 (iv) What is a dye ? 4
UNIT-I

 2. (a) Give an account of sampling techniques of gases. 4

(b) Explain the terms :

(i) Mean deviation

 (ii) Relative standard deviation 4

 (c) Discuss the types of errors. 4
OR

3. (p) Discuss the techniques of www.FirstRanker.com www.FirstRanker.com 4
 (q) Explain the process of sampling of solids. 4
 (r) Discuss :
 (i) Standard deviation
 (ii) Confidence limit. 4

UNIT-II

4. (a) Discuss the technique of paper chromatography. 4
 (b) Give an account of thin layer chromatography with applications. 4
 (c) Discuss the applications of HPLC. 4

OR

5. (p) Discuss the applications of chromatography in general. 4
 (q) Define chromatography. Give classification of chromatographic techniques. 4
 (r) Explain the principle and techniques of Gas Liquid Chromatography (GLC). 4

UNIT-III

6. (a) Explain the experimental requirements and factors affecting column efficiency. 6
 (b) Discuss the techniques of solvent extraction. 6

OR

7. (p) Define ion exchange. Discuss the ion exchange capacity of resins. 6
 (q) Describe factors affecting solvent extraction and application of solvent extraction in industries. 6

UNIT-IV

8. (a) Explain the technique of X-ray fluorescence with its applications. 6
 (b) Describe the principle, techniques and application of IR spectroscopy. 6

OR

9. (p) Give an account of elementary theory of flame photometry. 6
 (q) Draw and explain X-ray fluorescence spectrophotometer. 6

UNIT-V

10. (a) How are dyes classified as acid and basic dyes ? 4
 (b) Explain the preparation and uses of Indigo dye. 4
 (c) Discuss the manufacture of aurine dye. 4

OR

11. (p) Discuss crystal violet dye with respect to its preparation and uses. 4
 (q) Explain chromophores and auxochromes. 4
 (r) Describe the preparation of picric acid with uses. 4

UNIT-VI

12. (a) Explain the goals of Green Chemistry. 6
 (b) Discuss the principles of Green Chemistry. 6

OR

13. (p) Explain the basic components of green chemistry as alternative starting materials and alternative product and target molecules. 6
 (q) Explain the following :
 (i) Green solvent
 (ii) Bio catalysis
 (iii) Green fuels. 6