AR – 609

Sixth Semester B. Sc. (Part - III) Examination

INDUSTRIAL CHEMISTRY (R/V)

Instrumental Methods of Chemical Analysis, Green Chemistry

P. Pages : 7

Time : Three Hours] [Max. Marks : 80

Note : (1) Q. 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 scientific calculator is allowed.

1. (A) Fill in the blanks :—

(i) Sampling of ———— is more difficult than sampling of solid or liquids.

(ii) Anion exchange resins, which contain free anion can be exchanged for —— in solution.

(iii) Gas–liquid chromatography used for separating gaseous mixture and volatile ———— compound.

(iv) Some unsaturated organic compounds, although invisible on chromatogram in ordinary light, can be easily detected under an ———— lamp. 2

(B) Choose the correct alternatives :—

(i) Ion exchange chromatography includes ————

(a) Cation and anion exchange chromatography.

(b) Inorganic exchanger.

(c) Liquid exchanger.

(d) All of these.

(ii) Size Exclusion chromatography consists of————————

(a) Molecular sieve.

(b) Inorganic exchanger.

(c) Capillary electrophoresis.

(d) Liquid exchanger.

(iii) ———— may be defined as the degree of agreement between measured value and true value.

(a) Accuracy (b) Precision

(c) Deviation (d) Error

(iv) Many solvent, particularly the volatile organic solvents come under regulatory restriction due to their ———— contribution to air and water pollution.

(a) Alloy (b) Metallic

(c) Toxic (d) All of these 2

(C) Answer in **one** sentence :—

(i) Which error is called as accidental error ?

(ii) Define dye intermediate.

(iii) Give the names of any two green solvents.

(iv) Why the adsorbent in column chromatography should be pure ? 4

UNIT I

2. (a) Discuss the following terms :—

(i) Accuracy and Precision.

(ii) Mean or average deviation. 4

(b) Explain the process of Random sampling. 4

(c) Discuss the types of errors. 4

OR

3. (p) Give an account of origin of error. 4

(q) Explain standard and relative deviation. 4

(r) Describe the sampling of solids. 4

UNIT II

4. (a) Define chromatography. Discuss the various applications of thin layer chromatography. 4

(b) Give the principle and technique of paper chromatography. 4

(c) Discuss the applications of HPLC. 4

OR

5. (p) Explain the technique of gas liquid chromatography. 4

(q) Discuss the various applications of thin layer chromatography. 4

(r) Differentiate between adsorption chromatography and gas liquid chromatography. 4

UNIT III

6. (a) Explain the ion exchange capacity and factors affecting ion exchange. 6

   (b) Explain the extraction techniques in solvent extraction. 6

OR

7. (p) Give the principle of solvent extraction and discuss the factors affecting solvent extraction. 6

   (q) Explain the experimental details of column chromatography. 6

UNIT IV

8. (a) Discuss the applications of flame photometry. 6

   (b) Discuss the technique of x–ray fluorescence. 6

OR

9. (a) Explain instrumentation and experimental techniques of flame photometry. 6

   (q) Explain the technique of IR spectroscopy. 6

UNIT V

10. (a) Define dye. Explain sulfur and pigment dye. 4

(b) Give the preparation of picric acid dye. 4

(c) Discuss :—

(i) Acid dye. (ii) Basic dye. 4

OR

11. (p) Discuss :—

(i) Chromophore.

(ii) Auxochrome. 4

(q) Give the classification of dyes on the basis of modes of application. 4

(r) What is dye intermediate ? Give the non–textile uses of dyestuffs. 4

UNIT VI

12. (a) Give the basic principles of green chemistry. 6

(b) Discuss the goals of green chemistry. 6

OR

13. (p) Discuss :—

(i) Green solvent.

(ii) Green fuel.

(iii) Ionic liquid. 6

(q) Explain the optimization of framework for the design of greener synthetic pathway. 6