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 all **SIX** questions carry **12** marks each.

(3) Draw diagrams wherever necessary.

(4) Use of calculator (non-scientific) is allowed.

1. (A) Fill in the blanks :-

(i) Picric acid is ___ colour dye.

(ii) The error which is either avoided or corrected is called as _ _.

(iii) In thin layer chromatography, mobile phase is ____.

(iv) Ionic liquids are coming to be used as green ____. 2

(B) Choose the correct alternatives :-

(i) ____ is green fuel.

(a) Methanol (b) Biodiesel

(c) Diesel (d) Ethanol.

(ii) ____ gives colour to the dye.

(a) Auxochrome (b) Chromophore

(c) Dye intermediate (d) Vat dye

(iii) In chromatography, on stationary phase, the substance gets :

(a) Absorbed (b) Adsorbed

(c) Resorbed (d) None of these

(iv) The degree of agreement between measured value and true value is called as ____.

(a) Deviation (b) Accuracy

(c) Precision (d) Error 2

(C) Answer in one sentence :-

(i) What is auxochrome?

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

(iii) Define Rf value.

(iv) What is a sample? 4

UNIT—I

2. (a) Explain the process of sampling of solids. 4

(b) In an alloy of tin, the percentage is found 40.22, 40.46, 40.28 and 40.32. Determine mean deviation. 4

(c) Discuss :-

(i) Deviation (ii) Confidence limit 4

OR

3. (p) Explain in detail the techniques of sampling of gases. 4
   (q) Discuss :-
   (i) Standard deviation (ii) Relative standard deviation 4
   (r) Explain in detail the technique of sampling by random method. 4

UNIT—II

4. (a) Describe the technique of ascending paper chromatography. 4
   (b) Give the principle and technique of gas-liquid chromatography. 4
   (c) Discuss the applications of HPLC. 4

OR

5. (p) Discuss adsorption chromatography. 4
   (q) Give an account of selection of mobile and stationary phase in liquid-liquid chromatography. 4
   (r) Give an account of Rf value. 4

UNIT—III

6. (a) Discuss the classification of solvent extraction systems. 6
   (b) Explain the experimental details of column chromatography. 6

OR

7. (p) What is ion exchange capacity? Explain the factors affecting ion exchange. 6
   (q) Discuss the factors affecting efficiency of column chromatography. 6

UNIT—IV

8. (a) Explain the principle and experimental details of IR spectroscopy. 6
   (b) Explain the elemental theory of frame photometry. 6

OR

9. (p) Discuss the experimental techniques of X-ray fluorescence. 6
   (q) Give the principle of flame photometry and explain its industrial applications. 6

UNIT—V

10. (a) Discuss :
   (i) Acid dye (ii) Basic dye 4
   (b) Give the preparation of picric acid dye. 4
   (c) What are dye intermediates? Explain any one dye intermediate. 4

OR

11. (p) What is dye? Give the classification of dye on the basis of mode of application. 4
   (q) Give the preparation of aurin dye. 4
   (r) Give the non textile uses of dye stuff. 4

UNIT—VI

12. (a) Discuss the goals of green chemistry. 4
   (b) Give an account of alternative reaction condition. 4
   (c) Discuss ionic liquid. 4

OR

13. (p) Give an account of alternative starting material. 4
   (q) Discuss biocatalysis with respect to green chemistry. 4
   (r) Explain optimization of framework for the design of greener synthetic pathway. 4