B.Sc. Part–III (Semester–VI) Examination

6S : 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) Give Chemical equations and draw diagrams wherever necessary.

(4) Use of scientific calculator is allowed.

1. (A) Fill in the blanks :

(i) Two important conditions for a substance to act as a dye is presence of chromophore and _____.

(ii) In paper chromatography, stationary phase is always a _____.

(iii) Supercritical liquid CO_2 is a very good _____ solvent.

(iv) For the preparation of deionised water, _____ technique is used. 2

(B) Choose the correct alternatives :

(i) The degree of agreement between the measured value and true value is called as _____.

(a) Accuracy (b) Precision

(c) Error (d) Deviation

(ii) The maximum adsorptive power is of :

(a) Silica gel (b) Al_2O_3

(c) MgO (d) $CaCO_3$

(iii) For analytical purpose, the most useful X-ray region lies between :

(a) 0.1–0.6 Å (b) 0.7–2.0 Å

(c) 2.0–10.0 Å (d) 10.0–100 Å

(iv) Other than colouring the fibres, the dyes are also used in and as :

(a) Colour photography

(b) Antiseptics

(c) Staining in bacteriology

(d) All of these 2

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

(i) What is green chemistry ?

(ii) Define mean or average deviation

(iii) What is ion exchange ?

(iv) Define sampling. 4

UNIT—V

10. (A) What is a dye ? Explain acid and basic dyes. 4

(B) Explain the preparation and uses of indigo dye. 4

(C) Discuss the conditions for a substance to act as a dye. 4

OR

11. (P) What are dye intermediates ? Give the non-textile uses of dyes. 4

(Q) Discuss :

(i) Sulfur dyes

(ii) Pigment dyes. 4

(R) Explain the classification of dyes on the basis of mode of application. 4

UNIT—VI

12. (A) Explain :

(i) E-green propellants

(ii) Ionic liquids. 4

(B) Discuss the goals of green chemistry. 4

(C) Give an account of optimization of Framework for the design of greener synthetic pathway. 4

OR

13. (P) Discuss the concept of green solvents. 4

(Q) Explain the principle of green chemistry. 4

(R) Describe alternative starting materials and alternative final products. 4

5. (P) Explain thin layer chromatography with respect to its principle and applications. 4

(Q) Discuss the technique of paper chromatography. 4

(R) Describe the instrumentation of gas liquid chromatography. 4

UNIT—III

6. (A) Discuss the classification of solvent extraction systems. 6

(B) Explain the experimental technique of column chromatography. 6

OR

7. (P) Give the principle of solvent extraction and explain the factors affecting it. 6

(Q) What is ion exchange capacity ? Explain the factors affecting ion exchange. 6

UNIT—IV

8. (A) Give the principle of IR spectroscopy and explain its applications. 6

(B) Discuss instrumentation and technique of X-ray Fluorescence. 6

OR

9. (P) Explain elemental theory of flame photometry. 6

(Q) Explain the instrumentation and technique of IR spectroscopy. 6

UNIT—I

2. (A) Discuss the sampling technique of gases. 4

(B) Explain :

(i) Deviation

(ii) Standard deviation. 4

(C) Describe different types of sampling procedures. 4

OR

3. (P) Give an account of sampling of liquids. 4

(Q) What is error ? Explain determinate types of errors. 4

(R) In an alloy, the percentage of iron found is 52.25, 52.60, 52.47. Determine mean and standard deviation. 4

UNIT—II

4. (A) Discuss the instrumentation of high performance liquid chromatography. 4

(B) Give the principle of gas liquid chromatography. 4

(C) Give an account of stantionary and mobile phases in paper chromatography. 4

OR