(i) Printed Pages: 3 Roll No. .....

(ii) Questions : 9 **Sub. Code :** | 1 | 1 | 7 | 0 | 3 |

Exam. Code : | 5 | 0 | 1 | 1 |

Bachelor of Science (FYUP) 1st Semester

(2124)

INDUSTRIAL CHEMISTRY

Paper : Basic Industrial Principles and Laboratory Operations, Data Analysis using A.I. ICHDSC

Time Allowed : Three Hours] **[Maximum Marks : 60**

Note :— Attempt **FIVE** questions in all including Q. No. 9 (Unit-V) which is compulsory question and selecting **ONE** question each from Units I–IV.

UNIT–I

1. (a) Define the following basic units :

(i) Mass

(ii) Time

(iii) Pressure

(b) How many significant figures does each of the following numbers have and indicate which zeros are significant ?

(i) 0.523

(ii) 80.4

(iii) 2.59×10^7

(c) What is mole fraction ? Calculate the mole fraction of ethanol and water in a sample of rectified spirit which contains 92% ethanol by mass. 3,3,6

2. (a) Using the appropriate exponential notation, express the following quantities in terms of basic SI units :

(i) 900 mg

(ii) 395 pm

(iii) 7.59 ns

(iv) 7.38 μA

(b) Differentiate between the following :

(i) Mole percent and weight percentage

(ii) Molecular weight and equivalent weight

(c) Explain mass fraction gradient. 4,6,2

UNIT–II

3. (a) What do you mean by strength of solution ? How will you find it ? List the factors on which it depends.

(b) Discuss the limiting reactant and excess reactant in stoichiometric analysis.

(c) Define mass-volume percent with example. 6,4,2

4. (a) Elaborate the preparation, storage and functions of primary standards and secondary standards.

(b) Depict the relationship between normality and molarity of solutions. 10,2

UNIT–III

5. (a) Elaborate the principle and theory of analytical balance.

   (b) Discuss the use of volumetric glassware in detail. 6,6

6. Describe the following :

   (i) Sources of errors in weighing and maintenance guidelines.

   (ii) Types & uses of desiccators and filter crucibles. 6,6

UNIT–IV

7. (a) Illustrate the components of pH meter.

   (b) What are systematic errors ? Discuss its different types. 4,8

8. (a) Describe the various safety measures while handling chemicals and waste generated in the laboratories.

   (b) What is ChemDraw ? Illustrate its special features. 8,4

UNIT–V
(Compulsory Question)

9. (a) Define derived units. Give two examples.

   (b) 2.02 g of KNO_3 are dissolved in 600 ml of solution. Calculate the formality of solution.

   (c) Explain parts per million (ppm).

   (d) Distinguish between Ostwald pipette and syringe pipette.

   (e) How can you do the calibration of pH meter ?

   (f) Explain accuracy and precision with suitable examples. 6×2=12