

M.Sc. (Part-I) (Chemistry) (CBCS Pattern) Semester-II
PSCCHT08 : Analytical Chemistry

P. Pages : 2

Time : Three Hours



GUG/S/25/11231

Max. Marks : 80

Note : All questions are compulsory and carry equal marks.

1. a) How gases are sampled? Explain procedure adopted in sampling of ambient air. 8
- b) Discuss the role of Noise in determination of detection limit of analytical techniques. 8

OR

- c) Distinguish between Dry Ashing & wet Ashing? 4
- d) Write a note on safety aspects in handling hazardous chemicals? 4
- e) Explain the concept of limit of detection and limit of quantification. 4
- f) Outline the analytical procedure for stoichiometry & sub-stoichiometry reaction? 4
2. a) Discuss principle and instrumentation in HPLC using well labeled schematic diagram. 8
- b) Discuss the principle of gas chromatography including concept of theoretical plates and Van-Deemter equation. 8

OR

- c) Explain the main applications of normal phase and reverse phase chromatography. 4
- d) Write a note on peak resolution and peak broadening. 4
- e) Write note on "Supercritical fluid chromatography" and their analytical aspect. 4
- f) Explain Temperature programmed Gas Chromatography with its applicability. 4
3. a) Explain the principle of flame photometry? Discuss various types of burners used in flame photometer? 8
- b) Explain the phenomenon of fluorescence & phosphorescence with examples? Discuss with examples fluorescence Quenching & concentration dependence of its intensity? 8

OR

- c) Draw Jablonski diagram & explain radio-active & non-radio-active transitions? 4
- d) What are fibre optic sensors? Explain its uses for different applications? 4
- e) Discuss applications of Phosphorimetry in detail. 4

- f) Explain construction and working of turbidimeter with schematic diagram? 4
4. a) Explain - 8
- i) Residual current ii) Limiting current
- iii) Migration current iv) Catalytic current
- b) Explain the principle of Polarography? Describe instrumentation and working of polarography. 8
- OR**
- c) Give types of amperometric titrations with examples? 4
- d) Describe experimental determination of half wave potential. 4
- e) Derive equation for polarographic wave? 4
- f) What are Reversible & Quasi-reversible electrode reactions explain? 4
5. a) Calculate volume of concrete HCl solution (11.3N) required to prepare 250 ml of 0.1N HCl solution? 2
- b) Explain the criteria for the representative sample. 2
- c) Give advantages of HPLC over GC. 2
- d) Explain about gel permeation chromatography. 2
- e) What type of particles can be measured using nephelometry? 2
- f) How does the emission of light in fluorescence differ from that in phosphorescence? 2
- g) Write Ilkovic equation and explain the terms involved in it. 2
- h) What is oxygen interference & deaeration? 2
