

M.Sc.(Chemistry) (Old and CBCS Pattern) Sem-II
CHE-204 / psccht08 - Paper-VIII : Analytical Chemistry

P. Pages : 2

Time : Three Hours



GUG/S/19/11231

Max. Marks : 80

1. a) Explain collection of soil sample for chemical analysis? What are Various tools used in the procedure of taking soil samples and preparation? 8
- b) Describe the Dry and Wet Ashing method of sample treatment. 8

OR

- c) Explain method of sampling of exhaust gases from industry. 4
- d) Differentiate between sensitivity and limit of detection. 4
- e) A water sample was analysed for hardness. 100mL of the sample was titrated with EDTA solution requiring 23.5mL. The EDTA solution was standardized against 25mL of 0.2m ZnSO₄ requiring 19.4mL. Calculate the hardness of water in ppm. 4
- f) Describe stoichiometric reactions with examples. 4
2. a) Describe in details the different types of detectors used in Gas chromatography. 8
- b) Discuss instrumentation in HPLC using well labelled Schematic Diagram. 8

OR

- c) Discuss the various types of columns used in GC with their limitations. 4
- d) Explain the main applications of normal phase and reverse phase chromatography. 4
- e) Write Van Deemter equation and explain HETP. 4
- f) Discuss the principle of Gas chromatography and factors affecting peak resolution. 4
3. a) Explain the principle of fluorometry on the basis of Jablonski Diagram. 8
- b) Explain the principle and discuss various types of interferences in flame Photometry. 8

OR

- c) Write short note on fluorescence quenching. 4
- d) Discuss the principle and applications of Nephelometry. 4
- e) Discuss standard-addition method in Flame Photometry. 4
- f) Discuss four applications of Phosphorimetry. 4

4. a) Explain the principle of Polarography? Describe construction and working of polarograph. 8
- b) Explain the simultaneous determination of metal ions using polarographic technique. 8

OR

- c) Describe limitations of Polarography? 4
- d) Describe experimental determination of Half wave Potential? 4
- e) Give types of amperometric titrations with examples? 4
- f) Calculate concentration of Cd^{2+} from following. 4
- $D = 7 \times 10^{-6} \text{ cm}^2 \text{ s}^{-1}$ $m = 2.5 \text{ mg / s}$
 $t = 5 \text{ sec.}$ $i_d = 100 \mu\text{A}$
5. a) Convert 0.05M. Solution of CaCO_3 (molecular wt. = 100) into parts per million (ppm). 2
- b) Explain the criteria for the representative sample. 2
- c) What do you understand by Gas-solid chromatography. 2
- d) Give advantages of HPLC over GC. 2
- e) Give any two limitations of flame photometry. 2
- f) Explain optical sensor. 2
- g) Write Ilkovic equation and explain the terms involved in it. 2
- h) Give advantages of DME. 2
