MANIPAL
ACADEMY of HIGHER EDUCATION

Reg.No.

DEPARTMENT OF SCIENCES, III SEMESTER M.Sc. (Chemistry)
END SEMESTER EXAMINATIONS, DECEMBER 2023
Principles and Practice of Analytical Chemistry [CHM 6161]
(CHOICE BASED CREDIT SYSTEM - 2020)

Time: 3 Hours Date: /11/2022 MAX. MARKS: 50

Note : (i) Answer **ALL** questions

(ii) Draw diagrams, and write equations wherever necessary

Q No	Question	Marks
1A	Discussion on the importance of separation techniques based on phase equilibria in the elimination of interferences from the sample Any 2 cases explanation with examples Completely miscible liquid mixture / Completely immiscible / Partially miscible 2+2 M	4
1B	Calculation of standard deviation – ½ M Calculation of Mean – ½ M Calculation of F Value - ½ M Interpretation of result – ½ M Calculation of t value – ½ M Interpretation of result – ½ M	3
1C	Discussion on any 3 types of systematic errors with examples i) Systematic error – different types ii) Random error 1+1+1 M	3
2A	Explanation on the use of any four mineral acids for the decomposition and dissolution of samples HCl H_2SO_4 Chromic acid HNO_3 Their mixtures	4
2B	i) 2 differences- 1 M ii) 2 differences – 1 M iii) 2 difference – 1 M	3
2C	Significance – 1 M Formula - ½ M Mass of steam = Calculation with unit – 1 ½ M	3
3A	Definition of confidence limit – ½ M Formula – ½ M Calculation of 95% confidence limit - ½ M Interpretation of result – ½ M Explanation of any 2 sampling procedure used for the extraction of sample from a metal sheet-2 M	4

3B	Derivation proving increase in efficiency of extraction with minimum solvent and maximum number of extractions – 2 M Reverse osmosis – explanation – 1 M Significance of reverse osmosis in purification – 1 M	3
3C	Glass electrode : Construction 1.5 M and working 1.5 M	3
4A	Supporting electrolyte 4 points with example : 2M Residual Current, 2 Reason 1M, Graph 1M	4
4B	Four effect 1.5M and Current maxima 1.5 M	3
4C	Stripping analysis: principle with diagram 1.5M, Electrogravimetry with diagram 1.5M	3
5A	COD, Principle 1M procedure and calculation 1M. Turbidity: Principle 1M procedure and calculation 1M.	4
5B	Fluorides: Principle 0.5M procedure and calculation 1M. Sulphate: Principle 0.5M procedure and calculation 1M.	3
5C	Two analysis of atmospheric samples 1.5 M each	3

****