QP Code : 12901

(2½ Hours) [Total Marks : 75

N.B. : (1) **All** questions are **compulsory**.
(2) **Figures** to the **right** indicate **full** marks.
(3) Use of log table / non-programmable calculator is allowed.

1. Answer any **three** of the following:
   A) Give an account of minimisation of determinate errors. 5
   B) Analysis of an ore for copper content gave the following results 5

copper content (%)	8.30	8.26	8.35	8.32	8.28

   calculate -i) relative average deviation from mean in pph
   ii) standard deviation

   C) a) Explain the purpose of sampling. 2
      b) Discuss briefly random sampling. 3
   D) Discuss the sampling of heterogeneous liquids and flowing liquids. 5
   E) In the gravimetric estimation of nickel, following results were obtained 5

Sample No.	Weight of sample (mg)	Amount of nickel (mg)
1	200	36
2	250	45
3	300	56

   If the sample contained 20% nickel, calculate :
   i) absolute error, and
   ii) relative error in pph & ppt.

   F) Describe different methods used for sampling of solids. 5

2. Answer any **three** of the following: 15
   A) Discuss the nature of titration curve in the titration of strong acid against strong base, mentioning suitable indicators.
   B) Draw a neat diagram of a single beam spectrophotometer. Write the function of different components.
   C) Discuss Mohr's method for the determination of end point.

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5. (A) Fill in the blanks.   4
   a) The difference between the highest and the lowest numerical value in the set of measurements is called_____.
   b) The errors which cannot be easily determined are called_____ errors.
   c) In sampling, different_____ are mixed to give gross sample.
   d) Sampling of air is called_____ sampling.

OR

(A) State true or false.   4
   p) In constant errors, the relative error remains constant.
   q) Precision represents reproducibility of the measurements.
   r) Accuracy is expressed in terms of standard deviation.
   s) Hydrofluoric acid is used to dissolve silicate rock samples.

(B) Fill in the blanks.   4
   a) For determination of end point in an acid base titration, an reagent used is known as_____.
   b) Prism is used as_____ in spectrophotometre.
   c) _____ is formed as a second precipitate in Mohr's method.
   d) Acid base titrations involve_____ reactions.

OR

(B) State true or false.   4
   p) Ferric alum is used as an indicator in Volhard's method.
   q) In UV-Visible spectrophotometer, only quartz cuvettes are used in visible region.
   r) Methyl orange can be used as an indicator for titration of $0.1M\ NH_4OH$ with $0.1M\ HCl$.
   s) In a spectrophotometer, gratings are advantageous as they can be used over a longer wavelength range.

(C) Fill in the blanks.   4
   a) In chromatographic separations, the mobile phase may be gas or _____.
   b) The relative position of migrated spot in chromatogram is indicated by the term_____ factor.
   c) In solvent extraction, the chosen organic solvent should be_____ in the aqueous phase.
   d) The best possible separation for a given D_A and D_B values, is given by_____ equation.

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OR

(C) State true or false.   4

p) Methods involving thin, flat system such as TLC are called planar techniques.

q) R_f vlaue depends on the temperature.

r) Nernst distribution law can be mathematically expressed as $K = \dfrac{C_w}{C_o}$.

s) Batch extraction method is preferred when solute has small distribution ratio.

(D) Fill in the blanks.   3

a) Secondary filter in fluorimetry absorbs _____ light.

b) The instrument used to measure turbidance is known as _____.

c) Only a small portion of sample reaches the flame in _____ burner in flame photometry.

OR

(D) State true or false.   3

p) Fluorescence is anisotropic property.

q) Fluorescence is delayed phosphorescence.

r) A separate lamp is required for the analysis of each element in AAS.