

- Q.3 a) Differentiate sensitivity and detection limit. Discuss the analytical and calibration sensitivity. [06]
b) Discuss the 'instrument for analysis' and 'performance characteristics of instruments' [06]

OR

- b) Explain the calibration of an instrument. Discuss the dynamic range of instrument.

- Q.4 a) Give the introduction of AC and DC current and differentiate it. [06]
b) **Answer the following** [06]
i) Explain the p-n junction and its characteristic.
ii) Discuss the transducer.

OR

- b) Discuss the operational modes of computerized instruments.

- Q.5 a) Give the introduction of automated systems. Discuss its advantage and disadvantages. [06]
b) Discuss the principles and applications of FIA [06]

OR

- b) **Answer the following**
i) Discuss the working of STAC.
ii) Give the note on 'dispersion' and influence variables.

- Q.6 a) Explain population and sample for analytical data. A sample of soda ash is analyzed by two different methods, giving the following results for the percentage of soda ash. [06]
Method 1 : $\bar{X}_1 = 42.34$, $s_1 = 0.10$, $n_1 = 5$
Method 2 : $\bar{X}_2 = 42.44$, $s_2 = 0.12$, $n_2 = 4$
(i) Are s_1 and s_2 significantly different? ($F_{table} = 6.59$) (ii) Are the two means significantly different at the 95% probability level. ($t = 2.365$)

- b) Discuss the histogram and frequency polygon for analytical measurements. What is the importance of these information? [06]

OR

- b) **Answer the following**
i) Discuss the mean and average deviation. A student standardized a solution of iodine and found the following molarities: 0.0512, 0.0520, 0.0516 and 0.0506. calculate the mean and relative average deviation of these results in ppt.
ii) Explain the method of least squares and its importance.

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