(c) What do you mean by chemical shift? Explain the factors that affect the chemical shift. (5,5,5)

6. (a) The peak absorbance of 4.15×10^{-3} M $KMnO_4$ at 555 mm in a 2.0 cm pathlength cell is 6.46, then find molar absorptivity and percentage transmittance of this solution.

(b) Does a large K_D means a high or low retention of the solute to an ion exchange resin? Justify your answer.

(c) Explain different types of errors. What are the soureces of various types of errors? (5,5,5)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5862 **J**

Unique Paper Code : 2172583601

Name of the Paper : DSC: Analytical Techniques in Chemistry

Name of the Course : **Bachelor of Science in Applied Life Sciences with Agrochemicals and Pest Management**

Semester : VI

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt any **four** questions.
3. All questions carry equal marks.

1. (a) Explain the working principle of thin layer chromatography in detail.

   (b) What do you mean by a mobile phase and stationary phase in a chromatographic technique? Explain with an example. (5,5,5)

2. (a) What do you mean by erros? Distinguish between determinate and indeterminate errors?

   (b) Explain how tests of significance are useful in the statistical quantitative analysis?

   (c) Explain solubility product of sparingly soluble salt and its relation with molar solubility. (5,5,5)

3. (a) Draw and explain the conductometric titration curve of the following

      (i) Strong acid vs strong base

      (ii) Weak acid vs strong base

   (b) What do mean by solvent extraction? Distinguish between batch extraction and continuous extraction.

   (c) Derive the mathematics relation of Beer-Lambert's law. What are the limitations of this law? (5,5,5)

4. (a) Sketch out the electromagnetic spectrum. State the fundamental law of spectroscopy.

   (b) Write detailed note on classification of electroanalytical methods. Discuss application of conductometric and potentiometric titrations.

   (c) Explain F-test and Q-test with a suitable example.

   (5,5,5)

5. (a) Discuss the various equilibrium processes in the solvent extraction of metal ion from an aqueous phase by solvation.

   (b) Suggest the effect on plate height (H) if each of the following changes were incorporated into a column chromatographic experiment:

      (i) An increase in flow rate

      (ii) An increase in diameter of the column

      (ii) An increase in temperature of the column.