

U.G. 6th Semester Examination - 2021**CHEMISTRY****Course Code : BCEMDSHC4****Course Title : Analytical Methods in Chemistry**

Full Marks : 30

Time : 2 Hours

*The figures in the right-hand margin indicate marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Answer any **ten** questions: 1×10=10
- What is relative error?
 - What do you mean by precision?
 - Find out the number of significant figures in the following numbers:
 96.500 ; 2.08×10^{-6}
 - What is stationary phase?
 - What is the basic criterion of a molecule to be IR active?
 - What is molar extinction co-efficient?

- How many vibrational degrees of freedom are observed in H_2O molecule?
- Name the radiation sources generally used in Atomic Absorption Spectroscopy.
- Write down the relation between percentage of extraction and distribution ratio.
- Write down the principle of Atomic Absorption Spectroscopy.
- What do you mean by detection limit?
- How the amount of component calculated from chromatogram?
- What is the driving force of moving mobile phase through stationary phase in planar chromatography?
- Define 'dead time' in chromatography.
- Find out the value of antilog (3.54×10^{24}) .

2. Answer any **five** questions: 2×5=10
- Which factors are affecting TG curves?
 - What are the advantage and limitation of paper chromatography?
 - What is calibration graph? Give its significance in spectrophotometric analysis.

- d) State the limitation of Job's method.
- e) Write down the fundamental requirements for a useful ion exchange resin.
- f) What do you mean by R_f value? Give its significance.
- g) Name two important application of thermo gravimetric analysis.
- h) Write the advantage and disadvantage of H_2 and H_e used as carrier gas in GC.

3. Answer any **two** questions: $5 \times 2 = 10$

- a) i) State Beer's law. How do you test the validity of Beer's law? Explain why deviation occurs in some cases.
- ii) Mention two important sources of error in spectrophotometric analysis. $3+2=5$
- b) i) What is the significance of student's t-test?
- ii) What are the criteria for a good solvent in liquid-liquid extraction? $3+2=5$
- c) i) A 50 ml volume of water containing 0.1 gm of analytes is to undergo liquid-liquid extraction by shaking with 25 ml

of an organic phase. It is known that distribution ratio for the analyte is 1/85. Compare the result of

- I) One extraction using all 25 ml of organic phase and
- II) Three extraction using 8.33 ml of organic phase.

ii) What is p^H 1/2?

$4+1=5$
