

U.G. 5th Semester Examination - 2021**CHEMISTRY****Course Code : BCEMDSHC3[DSE3]****Course Title : Instrumental Methods of Chemical Analysis**

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** of the following questions:
1×10=10
- What is the full form of FT NMR?
 - What do you mean by single crystal?
 - What is isoelectric point?
 - Draw the stretching mode of CO₂.
 - What is stationary phase in TLC?
 - What do you mean by hypsochromic shift?
 - What is chromophore?
 - What do you mean by random error?
 - What is the fingerprint region in IR?
 - What is the light source used in AAS?

- What is used as cathode in polarography?
- Write the relation between absorption and transmittance.
- Define ion-exchange capacity with its unit.
- What do you mean by molecular ion peak in mass spectroscopy?
- What reference is generally used in NMR spectroscopy?

2. Answer any **five** of the following questions:

2×5=10

- What is relaxation process in NMR?
- What is the difference between single and double beam UV-Vis spectrophotometer?
- Does isotopic replacement of an atom in a bond alter the stretching frequency?
- Why solvent with high viscosity is not employed to run a TLC?
- Discuss any two factors that affect the selectivity of ion exchange resins.
- What are the advantages to use aprotic solvents in NMR spectroscopy?
- What is the difference between gas chromatography and liquid chromatography?
- Which substances are used in column chromatography as stationary and mobile phase and why?

3. Answer any **two** of the following questions:

$$5 \times 2 = 10$$

a) Write short notes on: $2.5 \times 2 = 5$

i) Potentiometer

ii) Hoffman Voltmeter

b) i) What is the FTIR and ATR?

ii) Discuss the advantages and disadvantages of AES. $2 + 3 = 5$

c) Discuss the advantages and disadvantages of AES. Mention two important errors in spectrometric analysis. 5
