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SUBJECT CODE NO:BB-2515
FACULTY OF SCIENCE AND TECHNOLOGY
B.Sc. (CBCGS) (Pattern 2022) T.Y SEM VI
Examination November / December 2025
Chemistry-XXIII Applied Chemistry

[Time: 1:30 Hours]**[Max. Marks: 40]**

Please check whether you have got the right question paper.

N. B

- 1) All questions are compulsory.
- 2) Draw diagram whenever necessary.
- 3) Use Only blue or black pen for writing.

Q1 Choose the correct option for following choice question**10**

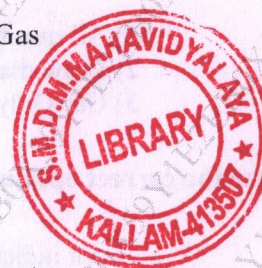
1. _____ is an indicator of the reproducibility of a measurement in an analysis.
 a) Accuracy b) selectivity c) sensitivity d) Precision.
2. The size of nanomaterial lies between _____.
 a) 0 to 50 nm. b) 10 to 1000 nm.
 c) 1 to 100 nm. d) None of these.
3. In scanning electron microscopy, the image is formed by _____.
 a) Transmitted electron b) Secondary and backscattered electrons.
 c) X-Ray. d) Photons.
4. The number of NMR signals found in ^1H NMR spectrum of Acetone are _____.
 a) 1 b) 2 c) 3 d) 4
5. The base peak in a mass spectrum corresponds to _____.
 a) the most abundant ion b) The highest mass ion
 c) The heaviest isotope d) The neutral molecule.
6. Which of the following nuclei is NMR active?
 a) ^1_1H b) $^{16}_8\text{O}$ c) $^{12}_6\text{C}$ d) $^{32}_{16}\text{S}$
7. Electromagnetic radiation used in NMR spectroscopy is _____.
 a) Micro wave b) Far infra red
 c) Radio Frequency d) Radar.
8. In HPLC, the mobile phase is typically;
 a) A Solid b) A gas c) A Liquid d) A Polymer.

9. In gas chromatography, the separation of compounds is based on,
 a) their solubility in water
 b) Their boiling points and Interactions with stationary phase
 c) Their electrical conductivity
 d) Their molecular weight.
10. The method of separating volatile or gaseous substance by using gas as mobile phase is called _____ Chromatography.
 a) TLC b) Paper c) Column d) Gas

Q2 Attempt any four of the following

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- a) What is dynamic light Scattering (DLS) technique?
 b) Explain principle of solid-liquid chromatography.
 c) Give a List of components of gas chromatography apparatus.
 d) How many signals are observed in ^1H NMR spectrum of ethane, ethanol and ethanal?
 e) What is molecular ion peak?

**Q3 Solve any two of the following**

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- a) Explain in briefs Luminescence and RI detectors used in HPLC.
 b) Explain with schematic diagram Transmission electron microscopy technique.
 c) Rationalising the following spectral data, deduce the structure of a compound with molecular formula $\text{C}_3\text{H}_7\text{NO}$
 $\text{UVi. } \lambda_{\text{max}} 238\text{nm}$
 $\text{IR: } 3428\text{cm}^{-1}, 2941 - 2857\text{cm}^{-1}$
 $1681\text{cm}^{-1} \text{ and } 1452\text{cm}^{-1}$
 ^1H NMR:
 $\delta 1.9 (\text{s}, 3\text{H})$
 $\delta 2.7 (\text{s}, 3\text{H})$
 $\delta 8.31 (\text{s}, 1\text{H})$

Q4 Solve any two of the following

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- a) Explain rule 13 for the determination of molecular formula of a compound with molecular weight 92
 b) Discuss optimisation of mobile phase in HPLC.
 c) Write short notes on
 i) Procedure ii) Protocol.