

Question Paper

Exam Date & Time: 08-Jul-2023 (10:00 AM - 01:00 PM)



MANIPAL ACADEMY OF HIGHER EDUCATION

BPharm VIIIth Semester
End Semester Examination May 2023

Advanced Instrumentation Techniques [PQA-BP811ET -S2]

Marks: 75

Duration: 180 mins.

I Multiple Choice Questions (MCQs)

Answer all the questions.

Section Duration: 30 mins

1) Which of the following cannot be used as solvent for NMR spectroscopy (1)

- [Deuteriochloroform](#)
- [Carbon tetrachloride](#)
- [Carbon disulphide](#)
- [Ethyl acetate](#)

2) Coupling constant is _____ between adjacent peaks (1)

- [Distance](#)
- [Ratio of the distance](#)
- [Height](#)
- [Ratio of the Height](#)

3) ^{13}C NMR counts number of _____ (1)

- [Protons](#)
- [Carbon](#)
- [Hydrogen](#)
- [Sulphur](#)

4) Which of the following ion source is suitable for ionization of sample in a solid state? (1)

- [Matrix Assisted Laser Desorption Ionization](#)
- [Electrospray ionization](#)
- [Fast Atom Bombardment Ionization](#)
- [Chemical Ionization](#)

5) Which of the following ratio is measured by a mass spectrometer? (1)

- [m/z](#)
- [m/v](#)
- [m/d](#)
- [m/KE](#)

6) What type of diffraction pattern is observed with amorphous compounds? (1)

- [Long range](#)
- [Continuous](#)

- 7) [Halo](#)
[Intense bragg's](#) -----Column can be used to calibrate the linearity of an HPLC detector. (1)
- 8) [C26](#)
[C18](#)
[C16](#)
[C24](#) -----type of validation should be performed using the historical data (1)
- 9) [Prospective validation](#)
[Retrospective validation](#)
[Concurrent validation](#)
[Re-validation](#) What is the frequency of calibration of IR Spectrometer as per IP? (1)
- 10) [Once in Three months](#)
[Once in Nine months](#)
[Once in Year](#)
[Once in Six months](#) The main function of head space auto sampler in GC is (1)
- 11) [To vaporize the liquid sample and send vapourised sample to GC Column](#)
[To collect sample and inject into GC inlet](#)
[To provide high temperature as per analysis requirements](#)
[To detect the responses](#) Which of the following is **not** a calibration parameter of UV Visible Spectrophotometer? (1)
- 12) [Control of wavelength](#)
[Control of absorbance](#)
[Limit of stray light](#)
[Column oven](#) Which of the following instrument can be used for analysis of metal ions? (1)
- 13) [Fluorimetry](#)
[Nephelo-turbidometry](#)
[Flame Photometry](#)
[Potentiometry](#) One of the following is a Gamma emitter (1)
- 14) [¹⁴C](#)
[¹²C](#)
[¹²⁵I](#)
[³H](#) Most common disadvantage of SPE over LLE is (1)
- [Cartridges are expensive](#)
[Polluting environment](#)
[Not suitable for biological samples](#)

- [No reproducibility](#)
- 15) In liquid liquid extraction, the organic solvent is evaporated to dryness using (1)
- [Hot air oven](#)
[Using steam](#)
[Using flame](#)
[Using rotary evaporator](#)
- 16) Lack of precision in liquid liquid extraction is mainly due to (1)
- [Different solvents used](#)
[Emulsion effect](#)
[Type of sample](#)
[Temperature variation in analysis](#)
- 17) Which is the make and model of LC-MS/MS available in our laboratory? (1)
- [Thermo Scientific LTQ 146](#)
[LCMS-8060NX.](#)
[Waters Xevo TQ-XS.](#)
[QSite Triple Quad](#)
- 18) Which is the column demonstrated in LCMS/MS? (1)
- [C18](#)
[C8](#)
[Cyano](#)
[Phenyl](#)
- 19) In column description C18 - 150X4.1, 5u, 300A what is the meaning of C18? (1)
- [Stationery Phase](#)
[Mobile Phase](#)
[Support Phase](#)
[Maximum number of compounds separated.](#)
- 20) Which column was shown in GC-MS? (1)
- [Packed column](#)
[Open tubular column](#)
[Stainless steel column](#)
[Preparatory column](#)

II Long Answers

Answer all the questions.

- 1) Explain the technique used to measure the mass of sample against function of temperature using suitable example and a neat plot of thermogram. (10)
- 2) A drug testing laboratory is planning to calibrate a new Analytical balance instrument. Suggest them for the parameters to be calibrated with detailed explanation (10)

III Short Answers

Answer all the questions.

- 1) Explain the two-principle mode of relaxation in NMR (5)

- 2) List the types of mass analysers. Discuss the working of Time-of-Flight mass analyser with the help of a schematic diagram. (5)
- 3) Explain the application of X-ray diffraction with suitable examples. (5)
- 4) Explain briefly steps in liquid liquid extraction. (5)
- 5) Explain the applications of Radiimmuno assay. (5)
- 6) A high polar thermolabile molecule needs to be analysed by LCMS-MS? Which ionization technique best suits this compound? Explain its principle. (5)
- 7) Explain the working of reciprocating pump used in LCMS-MS. (5)

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