BRAINWARE UNIVERSITY

Term End Examination 2023-2024
Programme – B.Pharm-2019/B.Pharm-2020
Course Name – Advanced Instrumentation Techniques
Course Code - BP811ET
(Semester VIII)

Full Marks : 75 **Time : 3:0 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A
(Multiple Choice Type Question) 1 x 20=20

1. *Choose the correct alternative from the following :*

(i) Which of the following gases are used in NMR spectroscopy?

a) hydrogen, oxygen b) neon, nigtrogen
c) helium, argon d) helium, nitrogen

(ii) Identify the calculated delta value if in NMR Spectroscopy chemical moiety at 144Hz value.

a) 3.4 b) 2.4
c) 0.4 d) 1.4

(iii) Which option is put in the right order in analytical method validation?

a) Robustness, LOD, LOQ, Accuracy, Precision b) Accuracy, Precision, LOQ, LOD, Robustness
c) Precision, Accuracy, Robustness, LOD, LOQ d) LOQ, LOD, Accuracy, Precision, Robustness

(iv) Identify in solid phase extraction which solvent is used for conditioning?

a) Methanol, 10% methanol b) NaCl, 10% NaCl
c) NaOH, 10% NaOH d) HCL, 10% HCL

(v) Identify the maximum tolerance limit observed during control of absorbance at 430nm is,

a) 10.0 - 11.0. b) 15.0 - 16.0 .
c) 10.7 - 11.1. d) 15.7 - 16.1.

(vi) Recognize the resolution power observed with the help of solution of toluene in hexane.

a) 5.0 percent v/v solution . b) 0.1 percent v/v solution .
c) 1.0 percent v/v solution . d) 0.02 percent v/v solution .

(vii) Observe the photometric mode is used in the range of,

a) 200 nm to 400 nm. b) 50 nm to 200 nm.
c) 4000 nm to 8000 nm. d) 400 nm to 800 nm.

(viii) Identify the liquid liquid extraction occurs with the help of,

a) glass funnel. b) buchner funnel.

c) manifold. d) separating funnel.

(ix) Which of the following solvent is not used in NMR?

a) CHCL3 b) CCL4
c) CDCL3 d) D2O

(x) Select the following, By which chemical HPLC calibration and validation takes place.

a) Caffeine b) 0.1 N NaCl
c) 0.1 N NaOH d) KCl

(xi) Select the following, By which chemical pH 7.41 was prepared.

a) potassium dihydrogen phosphate b) 0.1 M KCl
c) 0.1 N NaCl d) 0.1 N NaOH

(xii) Select at the lowest level the sample start to detection its concentration called as,

a) Accuracy. b) limit of quantification.
c) Precision. d) limit of detection.

(xiii) Select the two main techniques for thermal analysis.

a) FTG AND DGG. b) MSP AND FCT.
c) TGA AND DTA. d) TSA AND DGF.

(xiv) Select the temperature required for the decomposition of CaCO3 in degree Celsius.

a) 200 b) 500
c) 900 d) 1200

(xv) Choose the following, In NMR Spectrometer it provides _____ and _____ method of determining structure in soluble chemical compounds.

a) Accurate, non-destructive b) Accurate, destructive
c) Inaccurate, Destructive d) Inaccurate, Nondestructive

(xvi) In NMR spectrum the nuclei in up field resonate operate at,

a) It is constant throughout the spectrum b) It doesn't depends on chemical shift
c) High frequency d) Low frequency

(xvii) Choose from which statement is true for calibartion parameter of UV-Visible Spectrophotometer potassium chloride is used,

a) control of absorbance b) limit of stray light
c) resolution power d) control of wavelength

(xviii) Predict in UV Spectrophotometer the principle we used as,

a) Newton's law. b) Lambert beer's law.
c) Competitive binding. d) covalent binding.

(xix) Predict the only _____ percent of the effluent of the liquid chromatography must be introduced in the mass spectrometer.

a) 1-2 %. b) 1-5 %.
c) 1-20 %. d) 1-15 %.

(xx) Choose a rapid TGA method is used for which of the following processes,

a) Decomposition of polymers exothermally. b) Decomposition of enzymes exothermally.
c) Decomposition of crystals endothermally. d) Decomposition of reactions isothermally.

Group-B

(Short Answer Type Questions) 5 x 7=35

2. Wite the name of some NMR solvents and mention the applications of NMR spectroscopy. (5)

3. Discuss the solvents used in NMR and mention the applications of NMR Spectroscopy. (5)

4. Describe the ICH guidelines for Validation. (5)

5. Explain the principle of Liquid-Liquid extraction method. (5)

6. Explain briefly about the applications of DTA. (5)

7. Explain the detailed principle of DSC with neat and labelled sketch. (5)

OR

Write a short note on X-Ray crystallography. (5)

8. Explain in detail about principle of HPTLC-MS. (5)

OR

Explain in detail about principle of LC-MS/MS. (5)

Group-C

(Long Answer Type Questions) 10 x 2=20

9. Define gas phase ionization, mention its types and describe chemical ionization process. (10)

10. Explain briefly about the different interfaces used in LC-MS/MS. (10)

OR

Explain the concept of hyphenation in modern instruments in pharmaceutical analysis with principle of HPTLC/MS. (10)

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