

PARUL UNIVERSITY
FACULTY OF PHARMACY**B. Pharm. Summer 2022 - 23 Examination****Semester: 8****Subject Code: BP811T****Subject Name: Advanced Instrumentation Techniques****Date: 25/04/2023****Time: 10:00am to 1:00pm****Total Marks: 75****Instructions:**

1. Figures to the right indicate maximum marks.
2. Make suitable assumptions wherever necessary.

Q.1 Multiple Choice Questions (MCQs) (1 Mark Each)**(20)**

1. What is the delta value for TMS in NMR?
a) 0
b) 10
c) 5
d) 7
2. Solvent commonly used in NMR is
a) Chloroform
b) Methanol
c) Carbon tetrachloride
d) Acetone
3. The inert gas used in the ionization stage of mass spectrometry is
a) Helium
b) Argon
c) Xenon
d) Methane
4. In mass spectra, the most intense peak is the
a) Base peak
b) Metastable ion peak
c) Fragment ion peak
d) Rearrangement ion peak
5. In mass spectrum M-18 peak indicates loss of
a) Hydroxyl group
b) Hydrogen
c) Methyl group
d) Water molecule
6. Coupling constant (J) value
a) Depends upon magnetic field
b) Is independent of field strength
c) Depends upon reference standard used
d) Depends on solvents used
7. TGA curve is a plot
a) Weight vs temperature
b) Weight vs volume of titrant
c) Weight vs current
d) Weight loss vs temperature
8. Which of following ionization technique is used in molecular weight determination of large biomolecule by using mass?
a) Electron impact
b) Chemical ionization
c) MALDI
d) None of the above
9. X-rays are generated by By moving plates
a) Coolidge tube
b) Geiger tube
c) Rotameter
d) Goniometer
10. Which of the following is an important aspect of Equipment validation?
a) Process Qualification
b) Process Validation
c) Performance Qualification
d) Instructional Qualification
11. Solvent extraction is a _____ analytical technique
a) Identification
b) Separating
c) Qualitative
d) Quantitative
12. Glass transition temperature is detected through
a) X ray diffractometry
b) Solution calorimetry
c) Differential scanning calorimetry
d) Thermogravimetric analysis

13. What is the representation of distribution coefficient
 - a) S
 - b) K
 - c) G
 - d) H
14. The guidelines that describe the analytical method validation – Text & Methodology are?
 - a) ICH Q8
 - b) ICH Q1
 - c) ICH Q2
 - d) ICH Q9
15. Thermospray is used as an interface in
 - a) GC-FTIR
 - b) HPLC-FTIR
 - c) GC-MS
 - d) HPLC-MS
16. Which of the following is used for calibration of IR spectrophotometer?
 - a) Polystyrene film
 - b) Nujol oil
 - c) Mineral oil
 - d) KBr
17. In X-ray powder camera technique, the detector used is
 - a) Bolometer
 - b) Electron Capture Detector
 - c) Photographic film
 - d) Thermistor
18. The calibration of an HPLC detector can be evaluated by measurement of?
 - a) Retention time
 - b) Temperature
 - c) Flow rate accuracy
 - d) Intensity of the peak
19. During DTA (Differential thermal analysis) what kind of reference material is used?
 - a) Chemically active
 - b) Physically active
 - c) Inert
 - d) Having catalytic property
20. Accuracy, linearity and precision tests forms a part of
 - a) Qualification of equipment
 - b) Calibration of equipment
 - c) Validation of equipment
 - d) Analytical method validation

Q.2 Long Answers (any 2 out of 3) (10 Mark Each)

(20)

1. Discuss in detail the validation parameter for analytical methods as per ICH guideline.
2. Draw a block diagram of MS. Discuss different detectors used in MS.
3. Define hyphenated techniques. Write in detail about LC-MS/MS or HPTLC-MS.

Q.3 Short Answers (any 7 out of 9) (5 Mark Each)

(35)

1. What is x-ray diffraction? Give detail idea about Bragg's law.
2. Write note on principle and instrumentation of radio-immunoassay.
3. Explain validation and calibration of UV-Visible spectrophotometer.
4. Define chemical shift. Elaborate factors affecting on chemical shift.
5. What is extraction? Give detail note on liquid-liquid extraction technique.
6. Write a brief overview of H-NMR spectroscopy.
7. What is the theoretical basis of DTA? Explain the difference between DTA and DSC.
8. Discuss various validation parameters as per ICH guideline.
9. Describe the difference between gaseous field ionization sources and field desorption sources. What are the advantages of each?