


Name:	
Enrolment No:	

UPES
End Semester Examination, December 2023

Course: Bioanalytical Techniques	Semester : 5
Program: B Tech Biotechnology	Duration : 3 Hours
Course Code: HSBT 3004	Max. Marks : 100

Instructions:

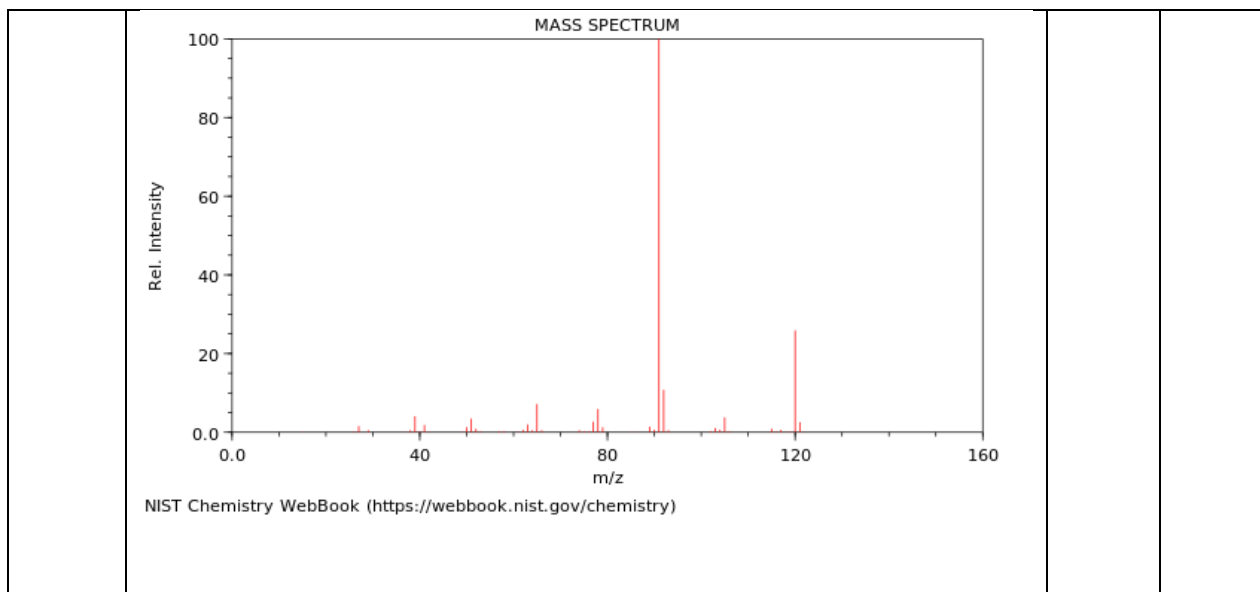
S. No.	Section A Short answer questions (20Qx1.5M= 30 Marks)	Marks	COs
1	Excitation wavelength is always higher than emission wavelength. True/False.	1.5	CO1
2	What information can be obtained from an IR spectra ? (1 point)	1.5	CO1
3	Circular dichroism (CD) is an excellent tool for rapid determination of the secondary structure and folding properties of proteins. True/False.	1.5	CO1
4	_____ is a phenomenon that occurs where electrons in a thin metal sheet become excited by light that is directed to the sheet with a particular angle of incidence, and then travel parallel to the sheet.	1.5	CO2
5	Name any one mass analyzer.	1.5	CO2
6	Give the x axis and y axis for IR spectra.	1.5	CO3
7	If the mass of a peptide is 880 and it has charge of +2 units. Where will you see a peak in mass spectra.	1.5	CO3
8	What do you mean by glass transition temperature.	1.5	CO3
9	Isothermal Titration calorimetry is used to study _____?	1.5	CO4
10	Which lamp used in UV spectrometer is _____	1.5	CO5
11	Define Phosphorescence.	1.5	CO5
12	What is 'base peak' in mass spectra?	1.5	CO3
13	Give any one example of fluorescence quenching.	1.5	CO4
14	Carbon dioxide is IR active. True/False.	1.5	CO1
15	What is the effect of increase in conjugation on lambda max?	1.5	CO1
16	Give full form of MALDI-TOF.	1.5	CO1
17	Give an example of hard ionization source.	1.5	CO2
18	What is the effect of oxygen on fluorescence intensity of a compound?	1.5	CO2
19	In what ratio does isotopes of chlorine shows peaks in mass spectra.	1.5	CO3
20	At what value of wavenumber does the carbonyl group shows a band in IR.	1.5	CO3

Section B
(4Qx5M=20 Marks)

1	Write two lines about (with diagram) a. Molecular ion peak b. Fragment ion peak	5	CO4
2	Describe FRET in fluorimetry with a diagram.	5	CO5
3.	Discuss why carboxylic acids show bands at lower wavenumber than esters.	5	CO5
4.	A student prepared a calibration plot using UV spectrophotometer with path length of 1 cm. The slope of the curve was found to be 300 L/mol. Molar absorptivity of the compound is ?	5	CO3

Section C
(2Qx15M=30 Marks)

1	<p>Given is a FT-IR spectra of an amino acid ($C_3H_7NO_3$). Identify the different types of bonds using the information given in the spectra. Propose the amino acid.</p> <p align="center">INFRARED SPECTRUM</p>	15	CO4
2.	Predict the compound using the given mass spectra (C_9H_{12}). Major peaks at 91, 120. Also, highlight parent ion peak and base peak.		CO4



Section D
(2Qx10M=20 Marks)

1	Write about application of circular dichroism.	10	CO5
2.	Discuss different peaks observed in DSC instrument?	10	CO5