Exam Date & Time: 07-Mar-2022 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

Manipal Academy of Higher Education, Manipal MPharm Theory End-Semester Examinations.

Modern Pharmaceutical Analytical Techniques [PQA-MIP101T - S2]

Marks: 75 **Duration: 180 mins.**

SECTION - A

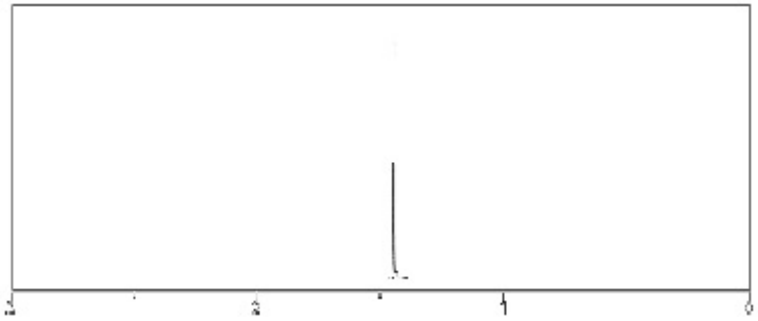
Answer all the questions.

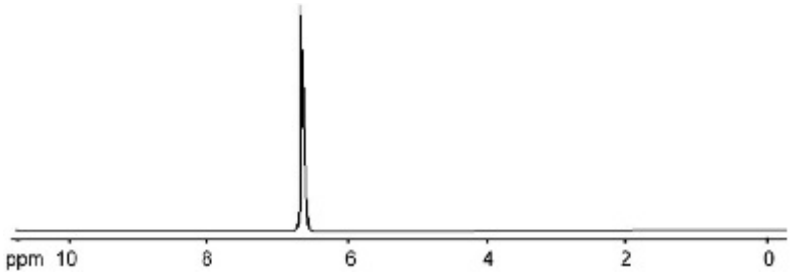
Answer the following (10 marks x 5 = 50 marks)

1) Explain light sources, Monochromators and any two detectors of double beam UV Visible spectrophotometer. (10)

2) a) Explain the problems of sample handling in IR spectroscopy.
b) Explain the sample handling for solids and gases in IR spectroscopy (2+8 marks) (10)

3) . Identify the NMR spectrum of cyclohexane and benzene from the following and justify (10)





4) A. Which of the following compounds will give a molecular ion having m/z = an odd number and why?

C_2H_5OH

CH_2BrCl

CH_3COOH

$C_2H_5NH_2$

$(CH_3)_2NCH_2C{\equiv}N$

B. What class of compounds is most likely to give a fragment ion at m/z = M-18 and why?

Alkenes

Cycloalkenes

Alcohols

Alkyl iodides

Benzene derivatives

(10)

5) (10)

Match the following and justify.

Analysis of atenolol tablets	Thermal Conductivity detector
Unknown plant extract by GC	Ion exchange chromatography
Concentration of pioglitazone in human plasma	HPLC with fluorescence detector
Content of sodium and potassium in deionised water	LC MS/MS (triple quad)
Estimation of riboflavin in "Red Bull – Energy Drink".	HPLC with UV detector
	Ion pair chromatography

SECTION - B

Answer all the questions.

Answer the following (5 marks x 5 = 25 marks)

6) Suggest the best development system for following paper chromatography and justify.
Stationery phase thickness 100 µm.
Mobile phase composition - glycerine: water: acetic acid - 70:28:2 %v/v
Sample volume - 120µL (5)

7) Explain the working of a thermobalance with neat labelled diagram. (5)

8) a) Write and explain Brags law.
b) List the applications of potentiometric determinations with relevant examples. (2+3) (5)

9) Compare Capillary electrophoretic methods with HPLC and GC methods. (5)

10) Explain the general methodology in ELISA. (5)

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