QP Code: RJ22MSC093 | Reg. No | | | | | | | | | | | AR 22

GIET UNIVERSITY, GUNUPUR – 765022

M. Sc (Second Semester) Examinations, July – 2023

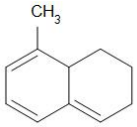
22CHPC204 - Organic Spectroscopy

(Chemistry)

Time: 3 hrs | Maximum: 70 Marks

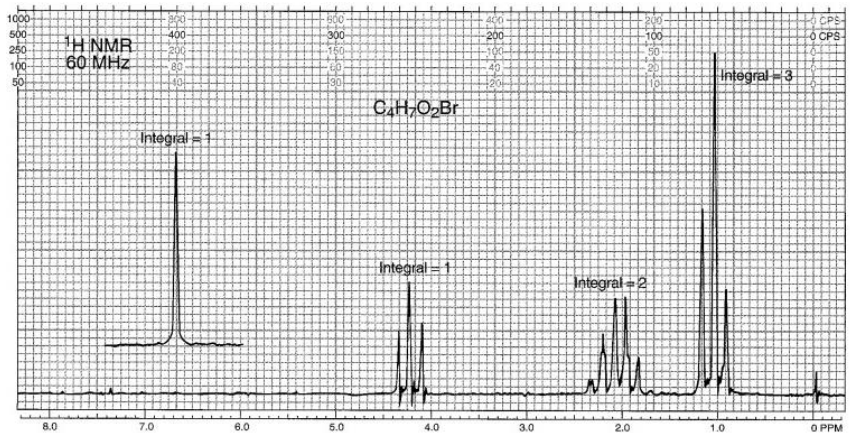
(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

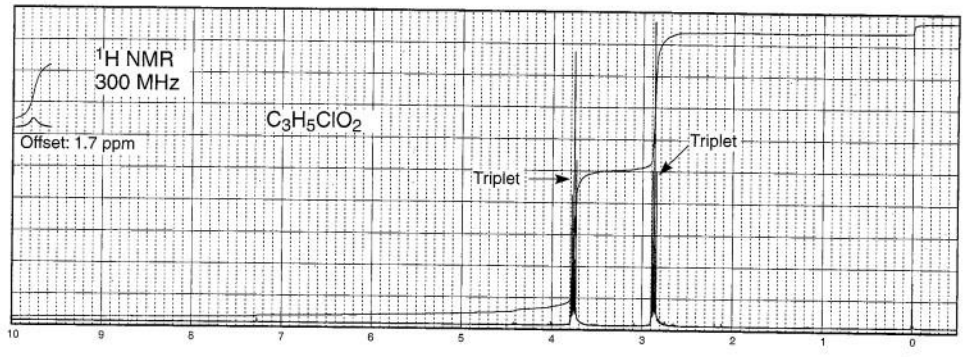
Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Calculate the λ_{max} of 	2	1
b. What is the steric effect on electronic transition?	1	2
c. A solution of thickness 3 cm transmittance 30 % incident light. Calculate the concentration of the solution given that molar absorptivity is 4000 $dm^3\ mol^{-1}\ cm^{-1}$.	2	2
d. What is fundamental frequency?	1	1
e. What is inductive effect?		2
f. Calculate the spin quantum number and allowed spin states $_1H^2$ and $_6C^{12}$	3	1
g. Find out the signals of Ethane, Ethene and benzene.	3	2
h. What is COSY.	3	2
i. What are hard and soft ionization techniques?	4	2
j. What is meta stable ion.	4	1

PART – B (10 x 5=50 Marks)

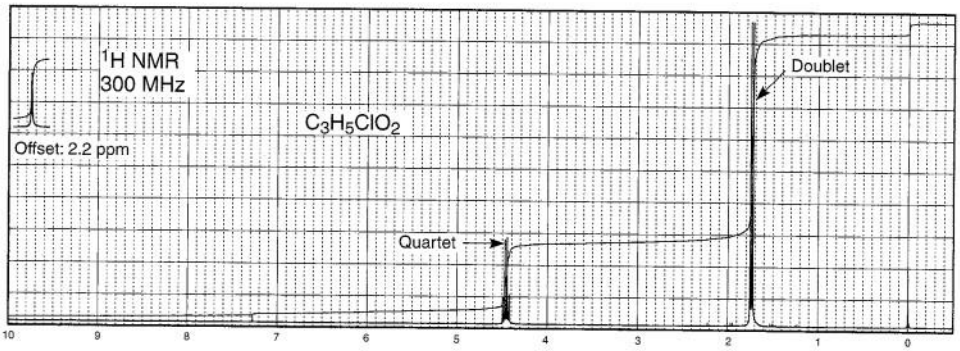
Answer ***ANY FIVE*** questions	Marks	CO #	Blooms Level
2. a. Explain Various electronic transitions.	6	1	1
b. Explain Blue and Red shift.	4	1	2
3.a. State and explain Beer-Lamberts Law.	6	1	2
b. The intensity of incident light on a sample is 0.50 w/m^2 and the intensity of light entering the detector is 0.36 w/m^2. Calculate the transmittance and absorbance.	4	2	2
4. a. Draw the spectrum of 2-butanone and Butanoic acid.		2	1
b. Draw the instrumentation of IR.	4	2	2
5.a. Write down the principle of NMR spectroscopy.	6	2	2
b. Explain chemical shift.	4	3	2
6. a. What is coupling constant and explain the factors affecting coupling constant.	6	3	1
b. The following compound is a carboxylic acid that contains a bromine atom: $C_4H_7O_2Br$. The peak at 10.97 ppm was moved onto the chart (which runs only from 0 to 8 ppm) for clarity. What is the structure of the compound?	4	4	2



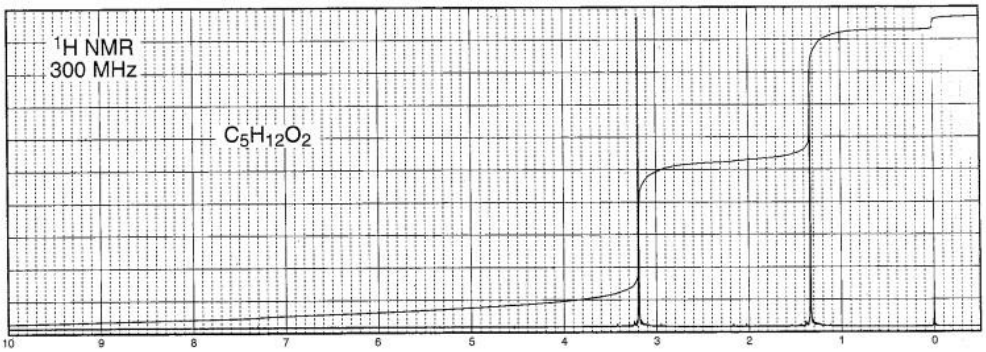
7.a. The two isomeric carboxylic acid that give the following NMR spectra both have the formula $C_3H_5ClO_2$. Draw their structures. 6 3 2



(b)



b. Draw the structure of ether with formula $C_5H_{12}O_2$ that fits the following NMR spectrum. 4 3 2



8. a. What is the principle of Mass spectroscopy? 6 4 2

b. What is Field desorption techniques? 4 4 1

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