

BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)

CLASS: M.PHARM
BRANCH: PHARMACY

SEMESTER : II
SESSION : SP/19

SUBJECT: MPC201T ADVANCED SPECTRAL ANALYSIS

TIME: 3.00 Hrs

FULL MARKS: 75

INSTRUCTIONS:

1. The question paper contains 7 questions each of 15 marks and total 105 marks.
 2. Candidates may attempt any 5 questions maximum of 75 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) An organic compound having molecular formula C_8H_8O burns with a sooty flame and gave an oxime with hydroxyl amine hydrochloride. Following absorption bands appear in its IR spectrum: (i) 2825 cm^{-1} (ii) 2717 cm^{-1} (iii) 3060 cm^{-1} (iv) 1700 cm^{-1} (v) 830 cm^{-1} . Deduce the structure of the compound. [7]
- Q.1(b) Write the theory and depth of penetration of ATR spectroscopy. Explain the factors affecting ATR spectrum. [8]
- Q.2(a) Explain the various types of 1-D NMR with suitable diagram. [7]
- Q.2(b) Predict the chemical shift positions for the protons of 4-nitroanisole and methyl acetate. [8]
- Q.3(a) Write a short note on flash chromatography. [7]
- Q.3(b) Discuss about the significance of HPTLC in drug development process. [8]
- Q.4(a) What is chemical shift? Explain electronegativity and anisotropic effect in chemical shift with suitable example. [7]
- Q.4(b) Assign the structure of the compound having molecular formula $C_9H_{11}Br$ showed the following signals in PMR data as follows (i) Multiplet δ 2.25 (2H) (ii) Triplet δ 2.75 (2H) (iii) Triplet δ 3.38 (2H) (iv) Singlet δ 7.22 (5H) [8]
- Q.5(a) Discuss the fragmentation pattern of aldehydes and ketones in MS. [7]
- Q.5(b) i. Distinguish between maleic acid & fumaric acid by IR Spectroscopy. [8]
ii. Distinguish between O-hydroxy & m-hydroxy benzoic acid by IR spectrum.
- Q.6(a) Answer the followings [7]
a) Fragmentation pattern of 4-Heptanone.
b) Explain the fragmentation pattern in MS of 2, 2-dimethyl pentane and 1-butanol.
- Q.6(b) Discuss in detail about the fragmentation pattern observed in MS with suitable example. [8]
- Q.7(a) What do you mean by thermal analysis? Justify thermal analysis by DTA. [7]
- Q.7(b) Explain about the significance of ELISA & RIA. [8]

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