JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

MSc-III Semester (BT)

Course Code (Credits): 20MS1BT312 (2) Max. Marks: 35

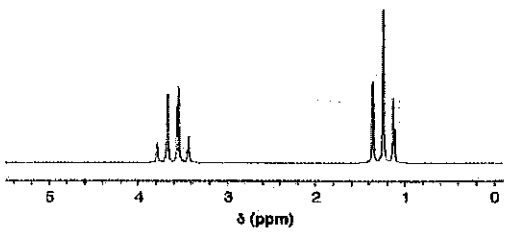
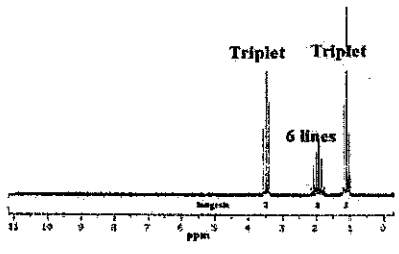
Course Name: Emerging Technology

Course Instructors: Dr. Abhishek Chaudhary Max. Time: 2 Hour

Note: (a)*All questions are compulsory.*

(b)Marks are indicated against each question in square brackets.

(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.No	Question	Marks
Q1	NMR (nuclear magnetic resonance) spectroscopy is a powerful analytical technique used to determine the structure of molecules by exploiting the magnetic properties of certain atomic nuclei. a. Describe in detail the principle of NMR spectroscopy b. Also describe the concept of chemical shift and factor affecting it. c. What do you understand by TMS and why is it used? d. Elaborate shielding and deshielding effect of NMR spectroscopy e. Name any two solvent generally used in NMR spectroscopy and explain why H_2O isn't thought to be a suitable solvent.	**3+2+ 2+2+2**
Q2	a. Find out the spin multiplicity of each signal in the 1H NMR spectrum of each of the following compounds as well as intensity distribution according to Pascal law a. Iodoethane b. 1,1,1-trichloroethane c. Acetone d. 2-Cholor-3- Bromo Butane e. Dimethyl Ether f. 1,1 Dichloro 2,2 dibromo ethane	**1.5*6**
Q3	The proton NMR of two compound X and Y is shown below. Propose the structure for both the compound using the concept of NMR. Also write down the intensity distribution ratio of both the peak for compound X and compound Y.  **Compound X**  **Compound Y**	**3+3**

END TERM EXAMINATION- DEC-2025

Q4	Nanobodies (Nbs) are emerging as a powerful tool in modern science, these single-domain antibodies have powerful binding and inhibitory capacity with great therapeutic potential. Explain the structural organization of nanobodies and how they differ from IgG antibody (Explain with suitable diagram). Also discuss the role of nanobodies in medical science	5
Q5	Fluorescence spectroscopy is a rapid, sensitive method for characterizing molecular environments and events samples. It is chosen for its extraordinary sensitivity, high specificity, simplicity and low cost as compared to other analytical techniques a. Explain the principle of fluorescence spectroscopy with a neat Jablonski diagram b. Describe foster resonance energy transfer and its biological significance	2+2

UNIT TEST-3 EXAMINATION- DEC 2019