JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

MSc-III Semester (BT)

Course Code (Credits): 20MS1BT312 (2) Max. Marks: 15

Course Name: Emerging Technology

Course Instructors: Dr. Abhishek Chaudhary Max. Time: 1 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	A Raman-active molecule shows a Raman shift of **1000 cm^{-1}**. If the excitation wavelength of laser will be 532 **nm**, calculate the wavelength of the a. Stokes Raman radiation. b. Antistokes Raman radiation	**5**
Q2	A compound X has a molar absorptivity of **12,000 L mol^{-1} cm^{-1}** at 260 nm. A **10 mL** solution of the compound gives an absorbance of **0.24** using a 1 cm cuvette. Calculate the **number of moles of the compound** present in the 10 mL solution.	**5**
Q3	a. Bright-field microscopes are widely used in cell biology to examine cellular morphology, including cell shape, size, and structural changes induced by small-molecule drugs. Explain the working principle of a bright-field microscope and discuss its major advantages and limitations. b. If the magnification of the objective lens is 40× and that of the eyepiece lens is 10×, calculate the total magnification of the microscope.	**3+2**

MID TERM EXAMINATION- SEP 2026

185