JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

M.Sc. (Microbiology) - II Semester

COURSE CODE (CREDITS): 18MS1BT313 (3) MAX. MARKS: 15

COURSE NAME: RECOMBINANT DNA TECHNOLOGY

COURSE INSTRUCTORS: Dr. Rahul Shrivastava MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems. (c)* ***Calculators are NOT allowed.***

Q.No.	Question	Marks
Q1	You are provided with a linear double stranded DNA of 5,000 bp which has the following restriction profile: • **EcoRI** cuts at 1,500 bp and 3,500 bp. • **HindIII** cuts at 4,000 bp. Calculate the number and size of restriction digestion fragments obtained in each case: a. If you digest the linear DNA with only **EcoRI** b. If you digest the linear DNA with only **HindIII** c. If you digest the linear DNA with **EcoRI** and **HindIII** together (double digestion) d. Sketch a well labeled agarose gel diagram showing different bands obtained when the digested product(s) obtained would be run from a, b, and c.	**[1+1+2+2=6]**
Q2	Compare and contrast the properties of Types of Ligases used in recombinant DNA technology experiments. How do their source, cofactor requirements, applications, and limitations differ?	**[3]**
Q3	In a restriction digestion experiment, the enzyme cuts non-specifically at multiple sites in addition to the specific restriction sites, and numbers of digested products obtained are more than expected. How can such phenomenon be explained and, how would you troubleshoot the issue?	**[3]**
Q4	Write Short Notes on **(ANY TWO) :** i. pBR322 ii. Artificial Methods of bacterial Transformation iii. Conformations of Plasmid	**[1.5 X 2 = 3]**