JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2025

M.Tech-I Semester (BT)

COURSE CODE (CREDITS): 13M11BT112 (3) **MAX. MARKS: 25**

COURSE NAME: Advanced Bioinformatics

COURSE INSTRUCTORS:Dr. Shikha Mittal **MAX. TIME: 1 Hour 30 Min**

Note: (a) All questions are compulsory.

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

Q.No	Question	Marks
Q1	Draw an E-R diagram for the following situation - A student has a student_id, name, and email. Each student can enroll in many courses, and each course can have many students. Each course has a course_id, course_name, and credits.	(5)
Q2	What are vectors, lists, matrices, and data frames in R? Give a brief example for each.	(4)
Q3	What is the purpose of R packages? Explain how to install a package and load it into the R session.	(3)
Q4	Write the output for the following queries – **Table: STUDENT** **a.** σ(Marks >80)(STUDENT) **b.** π(Name, Dept)(STUDENT)	(2)
Q5	Explain in brief – **a.** Strong and Weak entity **b.** Simple attribute, composite attribute, and derived attribute **c.** Primary and foreign key	(6)
Q6	Differentiate between reference-based and de novo assembly.	(3)
Q7	What are FASTQ files? Describe their structure.	(2)

RollNo	Name	Dept	Marks
1	Asha	CS	85
2	Ravi	EE	70
3	Meena	CS	90
4	Ritu	ME	60