

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- 2026

B.Tech-IV Semester (BI/BT)

COURSE CODE (CREDITS): 25B11BT415 (3)/25B11BT416 (4)

MAX. MARKS: 25

COURSE NAME: Molecular Biology

COURSE INSTRUCTOR: Dr. Jitendraa Vashistt

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. (c) Use of calculators is not allowed.

Q.No.	Question	CO	Marks
Q1	<p>Explain the following in brief.</p> <p>a) Similarity and dissimilarity between Replication and Polymerase chain reaction</p> <p>b) Biological significance of Epsilon and delta polymerase</p>	II, III	5
Q2	<p>a) How do you prove that <i>E.coli</i> replication is semi-conservative mode of replication?</p> <p>b) How do you compare the replication time taken by bacterial genomes and eukaryotic genomes? Which genome takes more time and why? Justify your answer with process of replication initiation.</p>	IV	2.5X2= 5
Q3	<p>In general, the replication in prokaryotes as well in eukaryotes occurs in the direction of 5' to 3' end. Is it possible that the replication process may occur in reverse orientation i.e. 3' to 5' end? Justify your answer with the model predication of replication in both of the orientations.</p>	III	5
Q4	<p>You need to amplify a gene segment using Polymerase chain reaction. However, the target is not get amplified in several attempts. How will you troubleshoot this problem on the basis of a) template, b) enzyme c) cofactor of the reaction d) dNTPs? Justify your answer with principle of each component.</p>	IV	5
Q5	<p>Which gel based technique you will apply to detect and prove the sequence of DNA? Also explain its principle, application and limitations.</p>	V	5