

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech-IV Semester (BT/BI)

COURSE CODE (CREDITS): 18B11BT412 (3)

MAX. MARKS: 35

COURSE NAME: Molecular Biology

COURSE INSTRUCTORS: Dr. Jitendraa Vashistt

MAX. TIME: 2 Hours

Note: (a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.

Q.N o	Question	CO	Marks
Q1	If you want to check that a DNA segment has an interaction with a protein for a specific mRNA transcription. Which of the molecular biology technique will be utilized to check the interaction? Explain the principle for the proof of interactions.	(CO-IV)	5
Q2	If you need to check the integrity of isolated DNA, how do you proceed for it? You also need to calculate the concentration of this isolated DNA (in microgram/ml), then what will be the method for calculations?	(CO-I)	5
Q3	Define the following in brief. a) semi conservative mode of replication b) Polymerase chain reaction principle	(CO-III)	5
Q4	<i>E. coli</i> has different types of DNA polymerases; however nucleotide extension/polymerization gets done with the help of specific polymerase. a) Define the different types of DNA polymerases of <i>E. coli</i> and their biological activities of polymerizing and proofreading. b) What is the reason of using a specific polymerase for nucleotide extension in <i>E. coli</i> replication?	(CO-IV)	5
Q5	Define the biological significance of promoter, pribnow box, and transcription start site in prokaryotic transcription process. Define each of these sites and decipher the general sequence of these sites.	(CO-III)	5
Q6	Primary eukaryotic transcripts usually undergo several modifications to form a mature mRNA. Why post transcription modifications of RNA are essential? Explain the molecular events of 5' modification and splicing of RNA.	(COIV)	5
Q7.	A group of bacterial structural genes that are transcribed together (along with their promoter and additional sequences that control transcription) makes an assembly. Name this whole cassette of transcription regulatory machinery. Explain how this regulatory machinery in bacterial cells controls transcription as negative Inducible & negative repressible? Justify your answer with principle of each component.	(COV)	5