

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**  
**TEST -2 EXAMINATION-2023**

**B.Tech-IV Semester (Biotechnology)**

**COURSE CODE (CREDITS): 18B11BT412, (3)**

**MAX. MARKS: 25**

**COURSE NAME: Molecular Biology**

**COURSE INSTRUCTORS: Dr. Jitendraa Vashistt**

**MAX. TIME: 1.5 Hours**

*Note: All questions are compulsory. Marks are indicated against each question in brackets.*

- Q1.** A molecular biologist wants to check that a DNA segment has an interaction with a protein. Which of the molecular biology technique is required to check these interactions? Explain the principle for the proof of interactions. **(COIV) (3marks)**
- Q2.** How do you identify a nucleotide sequence is present in a given DNA with the help of gel based methodology? **(COIV) (3 marks)**
- Q3.** What do you understand by the term "Immuno-fluorescence"? Explain the application of immuno-fluorescence in protein identification and location. **(COIV) (3 marks)**
- Q4. a)** What is the direction of replication (joining of nucleotides in growing chain of DNA)? Justify your answer with suitable model of replication. **(COIII) (3 marks)**
- b)** How do you explain that "the mode of replication is usually semi conservative in nature"? **(COIII) (3 marks)**
- Q5.** What is the inference of the following in completion of a successful "Polymerase chain reaction"? Also define the consequences if these molecules are not increased in the reaction mixture. **(COV) (1X 5= 5 marks)**
- a) dNTPS b) Magnesium ions c) Taq Polymerase d) Oligonucleotides/Primers e) Template
- Q6.** Although *E.coli* has different types of DNA polymerases, however major replication is completed with the help of a specific polymerase. **(COIII) (2.5X2= 5 marks)**
- a) Define the different types of DNA polymerases of *E.coli* and their biological activities of polymerizing and proofreading.
- b) What is the reason of using a specific polymerase for *E.coli* replication?