

**JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT**  
**TEST -3 EXAMINATION- May 2023**

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

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

**MAX. MARKS: 35**

**COURSE NAME: Molecular Biology**

**COURSE INSTRUCTOR: Dr. Jitendraa Vashistt**

**MAX. TIME: 2.0Hrs**

*Note: All questions are compulsory. Marks for each question are given in square brackets.*

- Q1.** What is the biological significance of 'shine-dalgarno' and 'kozak' sequences in translation?  
**(3 marks) (COIII)**
- Q2.** Although it has been observed that an amino acid may be coded by more than one codon, however, a few amino acids have a unique single codon. Name the amino acids which are coded by only by a single codon and write its codon.  
**(3 marks) (COIII)**
- Q3.** How do you prove that replication is semi-conservative and semi-discontinuous in nature?  
**(3 marks) (COIII)**
- Q4.** Although bacterial replication process occurs at fast rate, even that the process has an extraordinary degree of fidelity. Explain how the proof read mechanism occurs in bacteria to check errors and repair.  
**(3 marks) (COIV)**
- Q5.** After transcription, the nascent RNA need to undergo modifications and a mature mRNA get formed.  
**(COV)**
- a) What is the biological significance of post transcriptional modifications? **(2 marks)**  
b) Explain the molecular events of 5' modification of mRNA. **(4 marks)**  
c) Explain the structural features and mRNA processing through nuclear spliceosome. **(4 mark)**
- Q6.** In bacteria, structural genes are grouped together and simultaneously transcribed in such a way that it makes an assembly.  
**(COV)**
- a) Name this whole cassette of transcription regulatory machinery and define the role of each component. **(3 marks)**  
b) Explain how this regulatory machinery in bacterial cells controls transcription as negative Inducible & negative repressible? **(4 marks )**
- Q7.** If you want to stop the transcription of a gene which is responsible for cancer progression in a cell, then design a strategy with the utilization of histone medications and chromatin remodeling. Also explain the possible mechanism of the same. **(6 mark) (COV)**