JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- May 2019

B.Tech. IV Semester

COURSE CODE: 10B11BT413   MAX. MARKS: 35

COURSE NAME: **Molecular Biology**

COURSE CREDITS: **04**   MAX. TIME: 2.0Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1. What is the significance of pribnow box, kozak sequences and shine dalgarno sequences? **(3 marks) (CO3, CO4)**

Q2. Genetic code is degenerate and 18 of 20 amino acids are coded by more than one codon. However, two amino acids are coded by single codon. Name these amino acids. **(2 marks) (CO3)**

Q3. *E. coli* cells were cultured in N^{15} medium for several generations and then shifted to normal N^{14} medium for one generation. After that, the DNA was isolated from the culture using CsCl density gradient centrifugation method. Explain the type of DNA strands isolated and justify your answer in terms of replication. **(3 marks) (CO3)**

Q4. DNA replication process occurs in 5'-3' direction due to which the synthesis of nucleotides on both strands are not similar during process. However the second strand, where synthesis occur in fragments get completed by several enzymes. Name this strand and explain how the continuous synthesis is achieved on this strand of DNA? **(3 marks) (CO3)**

Q5. Explain the process of polymerase chain reaction and define the usage of each component utilized in PCR. **(4 marks) (CO5)**

Q6. Primary eukaryotic transcripts usually undergo several modifications to form a mature mRNA. **(CO4)**

a) Why these modifications are essential? **(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)**

Q7. Describe the following terms in brief. **(10 mark) (CO3, CO4)**

a) Histone modification and regulation of eukaryotic gene expression
b) Bacterial transcriptional positive control and catabolite repression