

Tutendra Vashita

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -2 EXAMINATION- 2016
B.Tech. IV Semester

COURSE CODE: 10B11BT413

MAX. MARKS: 25

COURSE NAME: **Molecular Biology**

COURSE CREDITS: 04

MAX. TIME: 1Hr 30 Min

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

- Q1. Why +1, -10 and -35 sites are important in prokaryotic genes? Define each of these sites and decipher the possible sequence/nucleotide of these sites. (2marks)
- Q2. Consider the following mRNA sequence: 5'-GAGAAUAACAAUGCAAACAUUU-3'. What is the sequence of the corresponding coding and non-coding strand and also define these sequences? (2marks)
- Q3. Differentiate between *cis*-elements and *trans*-elements of eukaryotic genes with suitable examples. (2marks)
- Q4. Why are there three types of RNA polymerases in eukaryotes and not in prokaryotes? (2marks)
- Q5. What is the additional structural unit present in the eukaryotic genome system which makes DNA less accessible to RNA polymerase? How this problem gets rectified? (2marks)
- Q5. DNA replication occurs at a faster rate; however it is not allowable for this process to get an error. Explain different mechanisms which prevent errors and proof read the process. Also explain the role of different DNA polymerases and enzymes for these processes. (3 marks)
- Q6. What would be the effect on the PCR reaction if any of the following circumstances arose? Justify the answer with explanation. (3 marks)
- There are excess of primers in the reaction mixture.
 - Annealing temperature reduced to 4⁰ lesser than optimum temperature.
 - Concentration of Mg²⁺ ions is diminished in reaction mixture.
- Q7. Design an experimental methodology and its principle by which you can prove that a specific stretch of DNA sequence is bounded with a protein. Also explain the process of retrieving these DNA sequences. (3 marks)
- Q8. Describe the following in brief. (3X2=6 marks)
- Rho dependent and Rho independent mechanisms of transcription termination
 - Similarities and differences of DNA replication and transcription.