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## GIET UNIVERSITY, GUNUPUR – 765022

B. Tech (Fourth Semester – Regular) Examinations, June – 2021

### BPCBT 4010 - MOLECULAR BIOLOGY

(Biotechnology)

Time: 2 hrs

Maximum: 50 Marks

#### Answer ALL Questions

The figures in the right hand margin indicate marks.

#### PART – A: (Multiple Choice Questions)

(1 x 10 = 10 Marks)

##### Q.1. Answer ALL questions

[CO#] [PO#]

- |  |   |   |
|--|---|---|
| a. If DNA is having the composition in which the amount of A is not equal to T and G is not equal to C then it should be   | 1 | 1 |
| (i) Circular single stranded                      (ii) Circular double stranded<br>(iii) Linear double stranded                      (iv) Plasmid  |   |   |
| b. Which of the following two cell organelles contains circular DNA?   | 1 | 1 |
| (i) Nucleus and chloroplast                      (ii) Mitochondria and golgi apparatus<br>(iii) Nucleus and Mitochondria                      (iv) Mitochondria and chloroplast  |   |   |
| c. The interaction between histone and DNA is based on   | 1 | 1 |
| (i) Covalent bond                      (ii) Hydrogen bond<br>(iii) Hydrophobic interaction                      (iv) Ionic interaction   |   |   |
| d. Telomerase enzyme functions as  | 2 | 1 |
| (i) DNA dependent RNA polymerase                      (ii) RNA dependent RNA polymerase<br><br>(iii) RNA dependent DNA polymerase                      (iv) DNA dependent DNA polymerase   |   |   |
| e. Which one of the following is a subclass of Type II topoisomerase?  | 2 | 1 |
| (i) Helicase                      (ii) DNA gyrase<br>(iii) Histone deacetylase                      (iv) Histone deacetylases  |   |   |
| f. Which one of the following is not true about promoter?  | 3 | 1 |
| (i) A binding site for Rho factor                      (ii) A binding site for RNA polymerase<br>(iii) A binding site for transcription factor                      (iv) Located at upstream of coding region  |   |   |
| g. 5' and 3' end of newly synthesised mRNA are modified by following enzymes   | 3 | 1 |
| (i) Guanylyl transferases and Polynucleotide Guanylyl transferase                      (ii) Adenylyl transferase and Polynucleotide adenylyltransferase<br>(iii) Adenylyl transferase and Polynucleotide Guanylyl transferase                      (iv) Guanylyl transferases and Polynucleotide adenylyltransferase |   |   |
| h. The A-site of a ribosome is a binding site for  | 3 | 1 |

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- |                                      |   |   |   |
|--------------------------------------|---|---|---|
| (i) rRNA                             | (ii) mRNA                                     |   |   |
| (iii) ATP                            | (iv) Aminoacyl-tRNA                           |   |   |
| i. The subunits of 80S ribosome are  |   | 3 | 1 |
| (i) 40S and 40S                      | (ii) 60S and 40S                              |   |   |
| (iii) 50S and 30S                    | (iv) 50S and 40S                              |   |   |
| j. Acetylation of histone results in |   | 3 | 1 |
| (i) Facilitates transcription        | (ii) Inhibits transcription                   |   |   |
| (iii) No influence on transcription  | (iv) Inhibits post transcriptional processing |   |   |

**PART – B: (Short Answer Questions)****(2 x 5 = 10 Marks)**Q.2. Answer **ALL** questions

- |  | [CO#] | [PO#] |
|--|-------|-------|
| a. What are the features of A-DNA?                                   | 1     | 1     |
| b. What is the role of 3'-5' exonuclease activity of DNA polymerase? | 2     | 1     |
| c. What is replication fork?   | 2     | 1     |
| d. What is the role of transcription factor?                         | 3     | 1     |
| e. What are the biological significance of DNA methylation?          | 3     | 1     |

**PART – C: (Long Answer Questions)****(6 x 5 = 30 Marks)**Answer **ANY FIVE** questions

- |  | Marks | [CO#] | [PO#] |
|--|-------|-------|-------|
| 3. Explain any two experiments to prove DNA as the genetic material.                             | 8     | 1     | 1     |
| 4. Compare the organization genome in mitochondria and nucleus.                                  | 7     | 1     | 1     |
| 5. Write the impact of understanding DNA replication and its application in PCR based diagnosis. | 5     | 4     | 1     |
| 6. Write short notes on homologous recombination and Holliday junction.                          | 8     | 2     | 1     |
| 7. Describe the post transcriptional modifications and its biological significance.              | 12    | 3     | 1     |
| 8. Describe stages of transcription in eukaryotes.   | 11    | 3     | 1     |
| 9. Elucidate genetic code and codon usage.   | 9     | 3     | 1     |
| 10. Write a short note on gene silencing.  | 6     | 3     | 1     |

--- End of Paper ---