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SEAT No. _____

No. of Printed Pages : _____

SARDAR PATEL UNIVERSITY
M.Sc. Biochemistry (SEMESTER-II)
Paper: PS02CBIC01- Molecular Biology
Date: 10th April, 2017 (Monday)
Time: 10.00 a.m To 1.00 p.m

Total marks: 70

1. Choose the most appropriate answer: (8 marks)

- i) Eukaryotes differ from prokaryotes in mechanism of DNA replication due to:
- a) Different enzyme for synthesis of lagging and leading strand
 - b) Use of DNA primer rather than RNA primer
 - c) Unidirectional rather than bidirectional replication
 - d) Discontinuous rather than semidiscontinuous replication
- ii) Which of the following equation is correct for double stranded DNA?
- a) $A+T= G+C$
 - b) $G/A= T/C$
 - c) $A+C= G+T$
 - d) $A/G= C/T$
- iii) During translation, the _____ site within the ribosome hold the growing amino acid chain while the _____ site holds the next amino acid to be added to the chain.
- a) A, P
 - b) P, A
 - c) A, E
 - d) P, E
- iv) Which of the following best describes the 'cap' modification of eukaryotic mRNA?
- a) A modified guanine nucleotide added to the 3' end of the transcript.
 - b) A modified guanine nucleotide added to the 5' end of the transcript.
 - c) A string of adenine nucleotides added to the 3' end of the transcript.
 - d) A string of adenine nucleotides added to the 5' end of the transcript
- v) The conserved regions recognized during intron splicing include
- a) intron- exon boundaries
 - b) 5' and 3' splice sites only
 - c) 5' and 3' splice sites and Polypyrimidine tract
 - d) only polypyrimidine tract
- vi) The modified base Inosine is formed from Adenine by
- a) Sulfur substitution
 - b) Deamination
 - c) Base isomerization
 - d) Methylation
- vii) The enzyme (made of proteins and RNA) that elongates chromosomes by adding repeat sequences to the end of existing chromosomes is
- a) Telomerase
 - b) Exonuclease
 - c) Endonuclease
 - d) Ribonuclease
- viii) In eukaryotes, transient gene expression is responsible for
- a) growth and development
 - b) response to environmental changes
 - c) both a) and b)
 - d) none of these

2. Write briefly on any seven:

(2x7 = 14 marks)

- a) Processivity and Fidelity of DNA polymerase in DNA replication.
- b) Leucine Zipper proteins.
- c) Promoter clearance during transcription
- d) Eukaryotic promoters.
- e) Mechanism of action of aminoacyl tRNA synthetase.
- f) The roles of -35 and -10 promoters of bacteria
- g) Role of chemical modifications in tRNA
- h) Catabolite repression
- i) Role of Homeotic genes in Drosophila development.

Q.3 (a) What is cot curve? How it is utilized to know the complexity of any organism? (06)

(b) Explain the mechanism of DNA polymerase. Explain how DNA polymerase distinguishes between rNTPS and dNTPs? (06)

OR

(b) Give a brief account on DNA supercoiling and explain the mechanism of action of γ topoisomerase. (06)

Q.4. (a) Explain the role of Tus protein in termination of DNA replication in prokaryotes. (06)

(b) What are histones? Discuss how histone modification regulates the gene expression in Eukaryotes (06)

OR

(b) Describe the properties of rho protein. Give detail account on rho dependent termination of transcription in prokaryotes. (06)

Q.5 (a) Describe the secondary and tertiary structure of tRNA in detail. (06)

(b) Discuss the role of SnRNPs during splicing of introns in eukaryotic mRNAs. (06)

OR

(b) Explain the steps involved in the initiation of translation in eukaryotes. How is this different from initiation in prokaryotes? (06)

Q.6 (a) What is attenuation? Give a detailed account of trp operon. (06)

(b) Enlist the events occurring during post-translational modifications. Explain any two events in detail. (06)

OR

(b) Explain the role of maternal genes in establishment of polarity in embryonic development of Drosophila. (06)

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