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Seat No. : _____

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SARDAR PATEL UNIVERSITY

B. Sc. (Biochemistry) – Fifth Semester Examination (CBCS)

Monday, 22nd October 2018

10:00 a.m. to 1:00 p.m.

US05CBCH01: Molecular Biology - I

Total Marks: 70

Note: (1) Figures to the right indicate marks.

(2) Draw a neat and labeled diagram, wherever necessary.

Q. 1 Choose the most appropriate answer from the four alternatives given: [10]

i. _____ is a organization unit of chromatin.

- (a) Nucleosome (b) DNA (c) Histones (d) Chromosomes

ii. Human mitochondrial DNA has _____ shape.

- (a) Single stranded linear (b) Circular
(c) Supercoiled (d) Double stranded linear

iii. DNA viruses tend to be _____ in size than RNA viruses.

- (a) Smaller (b) Equal (c) Larger (d) Double

iv. Which one of the following is required for the synthesis of primers?

- (a) DnaA protein (b) DnaB protein (c) DnaC protein (d) DnaG protein

v. The transfer of information from RNA to make new DNA, occurs in the case of _____.

- (a) Rretroviruses (b) Adenoviridae (c) Cortiviridae (d) Tectiviridae

vi. DNA replicates during _____ phase of cell cycle.

- (a) G0 (b) G1 (c) S (d) G2

vii. _____ is the DNA sequence to which RNA polymerase binds to initiate transcription.

- (a) Enhancer (b) Operator (c) Promoter (d) Repressor

viii. Process where introns are removed and exons are joined together is known as _____.

- (a) Intronic processing (b) Polyadnylation (c) Splicing (d) Capping

ix. _____ is a most common start codon.

- (a) AUG (b) UAG (c) UGA (d) UAA

x. Which type of modification possible in milk protein, α and β -caseins?

- (a) Carboxylation (b) Glycosylation (c) Methylation (d) Phosphorylation

Q.2 Answer any TEN from the following: [20]

i. What are histones?

ii. What are mobile genes?

iii. Differentiate between gene and genome.

iv. Write about prokaryotic DNA polymerases.

P.T.O.

- v. Write functions of DNA ligase and DNA helicase.
- vi. Differentiate between polymerase activity and exonuclease activity.
- vii. Define the terms introns and exons.
- viii. What are spliceosomes?
- ix. Write differences between group-III and group-IV introns splicing.
- x. What are the effects of toxins on protein synthesis?
- xi. State Wobble hypothesis.
- xii. Enlist various elongation factors for protein synthesis.

Q.3 Explain the concept of gene. Describe the structure of chromosomes. [10]

OR

Q.3 Describe salient features of prokaryotic genomes. [10]

Q.4 (a) Describe Meselson-Stahl experiment. [5]

(b) Write a note on Okazaki fragments. [5]

OR

Q.4 (a) Explain termination of DNA replication. [5]

(b) Explain functions of topo-isomerase during replication. [5]

Q.5 (a) Explain the splicing mechanism of Group – II introns. [5]

(b) Describe reverse transcription. [5]

OR

Q.5 (a) Describe generation of 5' cap in eukaryotic m-RNA. [5]

(b) Explain the splicing mechanism of Group – I introns. [5]

Q.6 (a) Enlist and explain any five characteristics of genetic code. [5]

(b) Write a note on transfer RNA. [5]

OR

Q.6 (a) Enlist inhibitors of protein synthesis by antibiotics. [5]

(b) Explain activation of amino acids. [5]

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