

SEAT No. \_\_\_\_\_

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SARDAR PATEL UNIVERSITY  
T.Y.B.Sc EXAMINATION, V<sup>th</sup> Semester  
Thursday, 24<sup>th</sup> December 2020, 02.00 to 04.00p.m  
Genetics: US05CGEN21 [Molecular Genetics]

NOTE- Figures in the right indicate full marks.

Maximum Marks-70

Q.1. Multiple Choice Questions (10 marks- One Mark for Each MCQ) [10]

1. The linking number directly depends on

- a. length of DNA
- b. shape of DNA
- c. configuration of DNA
- d. weight of DNA

2. Amino acid at binding motifs require for DNA binding

- a. arginine
- b. histidine
- c. glutamate
- d. All the above

3. When histone H1 is incorporated into a nucleosome

- a. it increases the probability that condensation of the chromatin will occur.
- b. the nucleosome is about to be moved by a remodeling enzyme.
- c. it means that replication of the DNA has just occurred.
- d. it means that the underlying DNA is probably a core promoter.

4. What is branch migration?

- a. Break and reformation of identical base pairs
- b. Formation of lesion
- c. Formation of heteroduplex DNA
- d. Dissolution occurs

5. Hybrid dysgenesis is caused by which of the following transposable element?

- a. Non-composite transposon
- b. LINE
- c. P-element
- d. Ac-element

6. Cof1/2 of the DNA defined as

- a. The time taken to reanneal
- b. Conc of DNA in a cell at a time
- c. initial conc of DNA multiplied by time of half of DNA to reanneal.
- d. amount of GC / AT bases in the single stranded DNA.

7. Which of the following enzyme works in the nucleotide excision repair?

- a. DNA photolyase
- b. ABC exonuclease
- c. DNA glycosylase
- d. RecA Protein

8. What is the final factor in eukaryotes that releases the peptide and ribosome?

- a. eRRF
- b. eEF2
- c. eRF3
- d. eRF4

9. The RNA polymerase activity

- a. DNA dependent DNA synthesis
- b. Direct repair
- c. DNA dependent RNA synthesis
- d. RNA dependent RNA synthesis

10. A DNA sequence is read by an RNA polymerase that produces complementary antiparallel RNA strand known as

- a. Hexa transcript
- b. secondary transcript
- c. primary transcript
- d. tertiary transcript

[4]

**Q.2. Fill in the Blanks and True – False (01 Mark each)**

[08]

1. The leucine zipper motif involves the cooperation of two \_\_\_\_\_ subunits.
2. Sequence specific DNA Binding Proteins generally interact with-----.
3. The direct repeat within the IS element has a length of \_\_\_\_\_
4. In single stranded nick \_\_\_\_\_ end of the nicked DNA invades other complete strand.
5. In eukaryotes the other name of PCNA is \_\_\_\_\_
6. ----- shows DNA renaturation reaction.
7. The eukaryotic initiation codon recognizes \_\_\_\_\_
8. The time taken by RNA polymerase to leave the promoter is describe as-----.

**Q.3. Short Answer Question (any 10 question X 2 marks each)**

[20]

1. Discuss about the protamins with its functions.
2. Write four differences between specific and non-specific DNA protein interaction.
3. Discuss about the function of Histone in DNA packaging.
4. Discuss about the recombinase enzymes for site specific recombination.
5. Write difference between retrotransposon and retroposon.
6. Describe the features of transposable elements.
7. Describe about the high fidelity DNA polymerase of eukaryotic Replication.
8. Discuss about the regulation of SOS Operon.
9. Discuss about the direct repair mechanism of DNA.
10. Discuss promoter for RNA polymerase III its function.
11. Discuss about the various group of introns.
12. Describe the termination of eukaryotic mRNA.

**Q.4. Long Answer Question (attempt any 4 X 08 marks each)**

[32]

1. Describe about the organization and expression of chloroplast genome.
2. Discuss the binding motifs having only DNA proteins interaction.
3. Describe the feature of P element with its map.
4. Discuss the mechanism of homologous recombination.
5. Derived the equation for Cot value of the highly repetitive DNA.
6. Describe the termination of eukaryotic Replication.
7. Describe the eukaryotic translation with its function.
8. Describe the initiation of transcription by RNA polymerase II.

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