SEAT No._____

[517]

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SARDAR PATEL UNIVERSITY

T.Y.B.Sc EXAMINATION, V[th] Semester

Thursday, 24th December 2020, 02.00 to 04.00p.m

BIOTECHNOLOGY: US05CBIT21 [Molecular Biology & 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.Amino acid at binding motifs require for DNA binding are generally

a) arginine b) histidine c) glutamate d) All the above

2. Zinc finger motifs are a particular characteristic not having

a) Zinc in center b) Four Histidine c) Four Cysteine d) Two Histidine and two cysteine

3. Which of the following is true of G-banding?

a) G-banding stains predominantly centromeres.

b) G-banding stains the region distant from centromeres.

c) G-banding stains a striped pattern on chromosomes.

d) G-banding stains chromosomes fluorescent yellow.

4. In nucleotide excision repair, the incision at 3' position of the lesion is done by

a) Uvr A b) Uvr B c) Uvr C d) Uvr D

5. The function of magnesium in the polymerization of DNA

a) It binds nucleotides in the cytosol and helps import them into the nucleus

b)It is a cofactor for DNA polymerase III

c)It binds to the two leaving groups during the DNA polymerization reaction

d)None of these answers are correct.

6. Why is TBP referred to as a universal transcription factor?

a) A single molecule of TBP initiates transcriptional processes.

b) TBP is present in both prokaryotic and eukaryotic organisms.

c) TBP catalyzes the synthesis of all known transcription factors.

d) TBP is required for initiation by RNAP I, RNAP II, and RNAP III.

7. Which of the following is not involved in the post transcriptional processing of t-RNA?

a) Base modulation b) Attachment of CCA arm

c) Splicing d) Attachment of poly-A tail

8. In the O-linked glycoprotein, the carbohydrates are attached to the following bases?

a) Valine b) Glutamine c) Asparagine d) Serine

9. Direct repeats in the IS element are present _____

a) Within the transposon b) Upstream the inverted repeat

c) Within the inverted repeat d) Downstream the inverted repeat

10. The type of mutation that is imposed by transposons is _____

a) Silent mutation b) Direct mutation

c) Polar mutation d) Frame shift mutation

Q.2.Fill in the Blanks and True –False (01 Mark each) **[08]**

1. The zinc finger domain found in----------an eukaryotes transcriptional factor.
2. The nucleosome is the fundamental subunit of ----------
3. Transportation of Histone in nucleus during replication is by---------
4. In strand-displacement model of mitochondrial replication leading strand DNA synthesis begins by displacing ----------
5. Enhancers are classically defined as ---------- DNA sequences that can increase the transcription of genes.
6. The only transcription factor ------- binds at minor groves of DNA.
7. The *Ac* element is autonomous, whereas the *Ds* element requires -------- to transpose.
8. Copia and Ty element are examples of _____

Q.3. Short Answer Question (any 10 question X 2 marks each) **[20]**

1. Discuss the principle of Q-banding.
2. Discuss the homeodomain binding motifs.
3. Write four differences between specific and non-specific DNA protein interaction.
4. Discuss about the high fidelity DNA polymerase.
5. Discuss trans-lesion synthesis with its importance.
6. Describe the regulation of SOS operon.
7. Describe the mechanism of enhancer in transcription.
8. Discuss the various classes of introns present in eukaryotes transcript.
9. Discuss about the splicing of organelle mRNA.
10. Describe retroposon with an example.
11. Discuss various method of transposition of transposable element.
12. Discuss four common features of transposable elements.

Q.4. Long Answer Question (attempt any 4 X 08 marks each) **[32]**

1. Discuss the binding motifs having DNA proteins as well as protein- protein interaction.
2. Discuss the principle and procedure of Gimsa banding.
3. Describe the post-replicative repair with its importance.
4. Discuss about the initiation of eukaryotic replication.
5. Discuss the initiation of transcription of by eukaryotic RNA polymerase III.
6. Describe the post transcriptional modification of rRNA.
7. Discuss retrotransposon with its types and example.
8. Discuss the mechanism of homologous recombination.

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