

SEAT No. _____

No. of Printed Pages: 02

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Sardar Patel University
S. Y. B. Sc. Fifth Semester Examination
Saturday, 26th December, 2020
02.00 p.m. to 04.00 p.m.

US05CGEN02: Molecular and Microbial Genetics

Note:

1. Figures to the right indicate marks.
2. Draw neat and labeled diagram, wherever necessary.

Maximum Marks-70

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

[10]

1. Chromosomal transfer occurs during conjugation only if:

- a) The F factor is integrated into the chromosome
- b) Both cells are donors
- c) Pili are absent
- d) Mutations occur simultaneously

2. A transducing phage:

- a) Contains only viral DNA
- b) Is sensitive to DNase
- c) May contain viral and bacterial DNA
- d) Can never transfer extrachromosomal genes

3. Gene transfer in bacteria by transformation has the following characteristics:

- a) A majority of the donor genes are transferred
- b) It involves a plasmid
- c) It depends on phage infection of the recipient cell
- d) It can be carried out using free DNA extracted from the donor.

4. Which of the following statements concerning nucleotide excision repair is FALSE?

- a) It is a type of mismatch repair
- b) It involves a nuclease
- c) It involves a DNA polymerase
- d) It involves DNA ligase

5. P element are responsible for:

- a) Mutation
- b) Sterility in progeny
- c) Chromosomal instability
- d) All the these

6. Reassociation kinetics of the genome depends on

- a) Genome Size
- b) Types of Nucleotide in genome
- c) Types of sequence in genome
- d) All the above

7. The end problem of eukaryotic replication is solved by

- a) Cyclin-CDK
- b) Reverse transcriptase
- c) Primase
- d) Telomerase

8. The hydrolytic step for the release of a polypeptide chain from ribosome is catalyzed by:

- a) Releasing factor
- b) Peptidyl transferase
- c) mRNA
- d) UAA

9. Which of the following is not part of RNA processing in eukaryotes?

- a) Splicing of exons
- b) Reverse transcription
- c) Addition of a 5' cap
- d) Addition of a poly A tail

10. The promoter is:

- a) A factor involving in translational process
- b) Associated with repressor of inducible operon
- c) A sequence located at the 3' end of a gene
- d) The binding site for RNA polymerase.

[1]

[P.T.O.]

Q.2. Fill in the blanks / True and false (8 Marks- One Mark Each)

[08]

1. The LHT classification is of Virus. (True/False)
2. _____ is the process in which DNA is transferred from one bacterium to another by a virus.
3. IS elements are _____.
4. The causative agents of genetic traits called hybrid dysgenesis in *Drosophila* is _____.
5. Chloroplast genomes (cpDNA) are _____ and relatively conserved among land plants.
6. C value of an organism is _____.
7. Transcription is the transfer of genetic information from _____.
8. Like replication, transcription also occurs bidirectionally. (True/False)

Q.3. Short Question (any 10 questions X 02 marks each)

[20]

1. What is episome? How it differ from plasmid.
2. What is basis of LHT classification of virus?
3. Describe the cross between the F^+ and F^- .
4. What is photo reactivation in DNA repair?
5. Discuss the importance of Rec protein in molecular biology.
6. Describe the various transposition mechanisms for transposable element.
7. What do you mean by C-value paradox?
8. Discuss the relation between Unique DNA and $Cot_{1/2}$.
9. Draw a map of chloroplast genome.
10. Describe the promoter for mRNA.
11. Describe proteolytic cleavage.
12. What is promoter? Discuss its function.

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

[32]

1. Describe the cross between the Hfr and F.
2. Discuss the classification of Virus with examples.
3. Describe the holiday model of recombination with its significance.
4. Discuss the transposable element associated with maize.
5. Describe the termination of eukaryotic Replication.
6. Describe the mitochondrial genome for animal cell with its map.
7. Describe the termination of mRNA by RNA polymerase II.
8. Describe any four post translational modification of polypeptide.

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