

Roll No.

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**M. Sc. (Second Semester)
EXAMINATION, May - June, 2022
BOTANY
Paper Second
[Molecular Biology]**

Time : Three Hours]

[Maximum Marks:80

Note : Attempt all sections as directed.

(Section - A)

(Objective/Multiple Choice Questions)

(1 mark each)

Note : Attempt all questions.

Choose the correct answer:

1. The process of DNA Replication is affected by an enzyme known as:
 - (A) Mutase
 - (B) Ligase
 - (C) Polymerase-I
 - (D) Ribonuclease

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2. The type of coiling is DNA is :

- (A) Zigzag
- (B) Left handed
- (C) Opposite
- (D) Right handed

3. Synthesis of protein is controlled by:

- (A) Nucleotide
- (B) RNA
- (C) DNA
- (D) Nueleoside

4. RNA is different from DNA because RNA contains:

- (A) Ribose sugar and uracil
- (B) Ribose sugar and thymine
- (C) Deoxyribose sugar and uracil
- (D) Deoxyribose sugar and thymine

5. DNA polymerase enzyme involved in mismatch repair system in E. coli is :

- (A) DNA-Poly-I
- (B) DNA- Poly-II
- (C) DNA- Poly-III
- (D) DNA- Poly- β

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6. 'Xeroderma pigmentation' in human is associated with a mutation in:
- (A) Photoreactivation
 - (B) Nucleotide excision repair
 - (C) Base excision repair
 - (D) Mismatch repair
7. What is a probe?
- (A) Chemically synthesized DNA
 - (B) Purified DNA
 - (C) Fragmented DNA duplex
 - (D) Either purified or synthesized single stranded DNA
8. Multigene families are :
- (A) Equivalent to the operons of prokaryotes
 - (B) Group of enhancers that control transcription
 - (C) Identical or similar genes that have evolved by gene duplication
 - (D) Sets of genes that coordinately controlled
9. C- value in genome represent :
- (A) Genetic disorders
 - (B) Phenotypic variation
 - (C) Amount of DNA present in the genome
 - (D) Qualitative traits

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10. Genetic information is transferred from nucleus to cytoplasm through
- (A) RNA
 - (B) Anticodon
 - (C) DNA
 - (D) Lysosomes
11. Which step does not occur in translation
- (A) Replication
 - (B) Termination
 - (C) Elongation
 - (D) Initiation
12. The process of RNA splicing shows the dominance of:
- (A) DNA world
 - (B) RNA world
 - (C) Microbial world
 - (D) Protein world
13. Which one of the following is not a component of lac operon models:
- (A) Promoter gene
 - (B) Structural gene
 - (C) Primer gene
 - (D) Regulator gene

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14. The sequence of structural gene in lac operon is:

- (A) lac A, lac Y, lac Z
- (B) lac A, lac Z, lac Y
- (C) lac Y, lac Z, lac A
- (D) lac Z, lac Y, lac A

15. In lac operon system, lac gene Z codes for:

- (A) Permiase
- (B) Repressor
- (C) Transacetylase
- (D) Beta-galactosidase

16. The 'mutation' term is firstly coined by in 1990.

- (A) Hugo-de-Vries
- (B) Seth Wright
- (C) Morgan
- (D) J. Muller

17. The mutation which causes death of all individuals when undergoes mutation. Then the mutation is called as:

- (A) Lethal mutation
- (B) Vital mutation
- (C) Sub-vital mutation
- (D) Kido-mutation

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18. 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

19. Translocation in plants was discovered by

- (A) Steen
- (B) Barbara Mc Clintok
- (C) Sutton and Boveri
- (D) Morgan

20. In sickle cell anaemia, glutemic acid is replaced by valine, triplet code for valine is:

- (A) GGG
- (B) AAG
- (C) GAA
- (D) GUG

Section - B

(Very Short Answer Type Questions)

(2 marks each)

Note: Attempt all questions. Answer using 2-3 sentences.

1. Write the role of DNA.

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2. What is restriction mapping?
3. What is C-value paradox?
4. What is the principle and application of the flow cytometry?
5. What is prokaryotic gene expression?
6. What is gene of function?
7. What is frameshift mutation?
8. What is chemical mutagens?

Section - C

(Short Answer Type Questions)

(3 marks each)

Note : Attempt all question. Answer precisely using 75 words.

1. How does RNA work with DNA?
2. What is the difference between transcription and translation?
3. What is Nuclear DNA concept?
4. What is Karyotype and when is it used?
5. Explain cis-trans complementation test?
6. What is meant by protein sorting?
7. What is gene mutation?
8. What is human inherited disease?

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Section - D

(Long Answer Type Questions)

(5 marks each)

Note: Attempt all question. Answer precisely using 150 words.

1. Describe the molecular structure of DNA.

OR

Write general account of transcription.

2. Write In-situe Hybridization and their techniques.

OR

Write an account on multigene families.

3. Describe the regulation of gene expression in prokaryotes.

OR

What is the process of protein sorting in endoplasmic reticulum and how the signal sequence is involved?

4. Write an account on site directed mutagenesis.

OR

Transposable elements in prokaryotes.

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