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Reg. No. :

Code No.: 5431

Sub. Code: ZBOM 22

M.Sc(CBCS) DEGREE EXAMINATION, APRIL 2023.

Second Semester

Botany – Core

GENETICS AND CELL BIOLOGY

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. In DNA, the enzyme which breaks the H₂ bond is
(a) Ligase (b) Helicase
(c) Topoisomerase (d) Polymerase
2. In which form of DNA, two anti-parallel chains are held together by base pairs?
(a) A-DNA (b) B-DNA
(c) Z-DNA (d) All of the above

3. Transduction involves
(a) Bacteria obtaining DNA from the external environment
(b) Bacteria obtaining DNA from the mother cell
(c) Transfer of genetic material through virus
(d) Transfer of genome by conjugation
4. Dimer repair mechanism include
(a) Excision repair
(b) Photoreactivation
(c) Recombinational repair
(d) All of these
5. One end of tRNA matches genetic code in three-nucleotide sequences known as
(a) Codon (b) Genetic code
(c) Blunt ends (d) Anticodon
6. The process by which protein synthesis from genetic code occurs is best described by
(a) Transcription (b) Translation
(c) Replication (d) Reproduction



7. The enzyme that catalyzes the transposition of an IS element is called _____.

- (a) Transposase (b) Integrase
(c) Transcriptase (d) Polymerase

8. Which of these operons is anabolic?

- (a) Lac (b) Ara
(c) Trp (d) Phe

9. The meiotic division takes place in

- (a) Meristematic cells (b) Conductive cells
(c) Reproductive cells (d) Vegetative cells

10. Which of the following statements is true about the ends of the chromosome?

- (a) The ends of the chromosome are called Satellites
(b) The ends of the chromosome are called Centromeres
(c) The ends of the chromosome are called Telomeres
(d) The ends of the chromosome are called Kinetochore

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PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).
Each answer should not exceed 250 words.

11. (a) Explain the various types of DNA.

Or

(b) Summarize the role of enzymes in DNA replication.

12. (a) Elucidate the different stages of the lytic cycle of T4 phage.

Or

(b) Summarize the importance of gene mutation.

13. (a) Describe the various types of RNA.

Or

(b) Summarize the properties of genetic code.

14. (a) Illustrate the general structure of an operon.

Or

(b) Summarize the characteristics of Transposons.

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[P.T.O.]



15. (a) Define the term mitosis and write its significance.

Or

- (b) Describe the structure of Lampbrush chromosome.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)
Each answer should not exceed 600 words.

16. (a) Explain the double helix structure of DNA.

Or

- (b) Describe the DNA replication in prokaryotes.

17. (a) Explain the mechanisms of DNA repair.

Or

- (b) Discuss the sex determination in plants.

18. (a) Describe the process of transcription in prokaryotes.

Or

- (b) Describe the process of translation.

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19. (a) Describe the various steps of eukaryotic gene regulation.

Or

- (b) Illustrate the gene regulation in prokaryotes.

20. (a) Distinguish between prokaryotic cells and eukaryotic cells.

Or

- (b) Describe the various phases of meiosis cell division.
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