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Reg. No. :

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M.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2022

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. The process of DNA replication is affected by an enzyme known as
 - (a) Mutase
 - (b) Ligase
 - (c) Polymerase I
 - (d) Ribonuclease
2. The types of coiling in DNA is
 - (a) Zig-zag
 - (b) Left-handed
 - (c) Opposite
 - (d) Right-handed

3. What is the correct definition of excision repair?
 - (a) Repair of a single damaged nucleotide
 - (b) Repair of a damaged oligonucleotide
 - (c) Removal of a single damaged nucleotide
 - (d) Removal of damaged oligonucleotide
4. Which enzyme is activated during double stranded break?
 - (a) DNA polymerase
 - (b) Translational polymerase
 - (c) RNA polymerase
 - (d) Klenow fragment
5. Which of the following RNA serves the regulatory functions including splicing, gene silencing?
 - (a) mRNA
 - (b) tRNA
 - (c) rRNA
 - (d) small RNA
6. Enhancers are special cis-acting DNA sequences that increase the rate of transcription by RNA polymerase. Which of the following is true regarding enhancers?
 - (a) 10 nucleotide upstream elements
 - (b) 25 nucleotide downstream elements
 - (c) present closer or 1000s nucleotide upstream or downstream of TSS
 - (d) All of the above



7. One gene-one enzyme hypothesis of Beadle and tatum was experimentally proved in

- (a) *Saccharomyces* (b) *Neurospora crassa*
(c) *Lathyrus odoratus* (d) *Claviceps*

8. Which polycistronic structural gene is regulated by a common promoter and regulatory gene?

- (a) Trp operon (b) Lac operon
(c) Ara operon (d) His operon

9. In the cell cycle DNA synthesis takes place during

- (a) G1 phase (b) G2 phase
(c) S phase (d) Prophase

10. A biosynthetic phase where cell organelle duplicate itself is

- (a) Interphase (b) Anaphase
(c) Prophase (d) Telophase

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Write notes on repetitive DNA.

Or

(b) Describe about bacterial DNA.

12. (a) Comment on photo reactivation.

Or

(b) Explain lysogenic cycle.

13. (a) Mention the transcription in eukaryote.

Or

(b) List out the physical mutagens.

14. (a) Write notes on pseudogenes.

Or

(b) Comment on split genes.

15. (a) Describe the cell adhesion.

Or

(b) Write notes on structure of Lampbrush chromosomes.



PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) Discuss on DNA synthesis and replication in eukaryotes.

Or

- (b) Give an account on chloroplast DNA.

17. (a) Write an essay on bacterial transformation and transduction.

Or

- (b) Describe the chemical mutagens and its mode of action.

18. (a) Discuss on post transcriptional changes in RNA.

Or

- (b) Write an essay on translational inhibitors.

19. (a) Give an account on gene silencing.

Or

- (b) Describe about operon concept.

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20. (a) Discuss on different stages of mitosis and its significance.

Or

- (b) Write detailed notes on cell cycle.
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