

2023

BOTANY — HONOURS

Paper : CC-11

(Cell and Molecular Biology)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* questions : 2×5
 - (a) State the function of Kinetochore.
 - (b) What are the importance of nuclear lamina? Name the chief component proteins involved in its formation.
 - (c) Define operon.
 - (d) Why is chloroplast DNA called semiautonomous? Give an evidence in support.
 - (e) Name the thermolabile enzyme involved in PCR technique. Point out the source of this enzyme.
 - (f) What is RLF? State its function.
 - (g) What is RNA interference?
 - (h) What is PCNA? State its role.
2. Answer *any two* questions :
 - (a) Discuss the structure and function of nuclear pore complex with neat labelled sketches. 5
 - (b) Justify degeneracy of genetic code on the basis of Wobble hypothesis. 5
 - (c) Define vector with a suitable example. State the properties of an ideal cloning vector. 2+3
 - (d) Explain the mechanism of positive control in *lac*-operon. 5
3. Answer *any three* questions :
 - (a) (i) What is miRNA?
 - (ii) Distinguish between the prokaryotic and eukaryotic transcriptional processes. 2+4+4
 - (iii) Write a note on post-transcriptional modification of hnRNA in eukaryotes.
 - (b) (i) Write down the events that occur in different checkpoints of cell cycle.
 - (ii) Describe the DNA packaging in eukaryotic chromosome with special emphasis on nucleosome concept. 5+5

Please Turn Over

- (c) Explain aminoacylation of tRNA. Describe the different steps occur in translation of prokaryotes. State the differences between prokaryotic and eukaryotic translations. 2+6+2
- (d) (i) Illustrate the process of semiconservative DNA-replication in prokaryotes with special references to the enzymes involved.
- (ii) Discuss the fidelity of DNA replication in prokaryotes. 6+4
- (e) (i) What is apoptosis?
- (ii) Mention the different properties of a cancer cell in brief.
- (iii) Discuss the role of tumor suppressor gene in cancer development.
- (iv) Role of cyclin D₁ for development of cancer — discuss. 2+2+4+2
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