

2020

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 from the following : 2×5
- (a) State the central dogma of living organisms.
 - (b) Comment on the importance of nuclear lamina.
 - (c) Why does DNA replication go from 5' to 3'?
 - (d) What are riboswitches? Give one example.
 - (e) What happens when a cell reaches G₀ stage?
 - (f) Name one thermostable enzyme used for DNA amplification. Mention its source.
 - (g) Is there a difference between oncogene and tumor suppressor gene?
 - (h) Name the histone proteins associated with nucleosome.
2. Answer **any two** questions from the following :
- (a) Write a brief essay about application of PCR technology in biotechnology. 5
 - (b) Discuss the role of telomerase in eukaryotic DNA replication and mention its importance. 4+1
 - (c) Enumerate the properties of genetic code mentioning the exceptions, if any. 5
 - (d) How does the initiation of translation occur in prokaryotes? 5
3. Answer **any three** questions from the following :
- (a) State the events occur during the G₁ – S and G₂ – M checkpoints in yeast cell cycle. Describe the role of MPF during cell-cycle progression. 6+4
 - (b) What is an operon? Describe the structure of lac-operon. Discuss with diagrams the negative control of lac-operon. 2+3+5
 - (c) Describe briefly about the events that led to transition from RNA to DNA world. What is endosymbiosis? How endosymbiotic theory helps to explain the origin of eukaryotic cell? 4+1+5

Please Turn Over

- (d) What are the structural differences between hnRNA and mRNA? What is spliceosome? Describe the prerequisite condition for DNA replication in prokaryotes. 2+2+6
- (e) What is cancer? Mention the different stages of cancer. What are the probable causes of cancer? Mention the role of 'Ras' gene in cancer. 2+2+4+2
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