

N.B.:

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer book.
- 4) Draw neat and labelled diagrams **WHEREVER** necessary.

SECTION-I

Q.1 a) Explain the organization of nucleosome. **(06)**

OR

What are nucleosides and nucleotides? Draw the structure of dinucleotide "AT" showing the structure of nucleotides and the phosphodiester linkage between them.

b) Attempt any **TWO** of the following: **(10)**

- i)** Describe Griffith's transformation experiment.
- ii)** Differentiate between prokaryotic and eukaryotic mRNA.
- iii)** If a virus particle contains double standard DNA with 2,00,000 base pairs
 - a) How many nucleotides will be present in the DNA?
 - b) How many complete spirals would occur on each stand?
 - c) How many atoms of phosphorous will be present?

Q.2 Write short notes on any **FOUR** of the following: **(16)**

- a)** Mitochondrial genome
- b)** Euchromatin and heterochromatin
- c)** Wobble hypothesis
- d)** ribosomal RNA
- e)** Interrupted and uninterrupted genes

SECTION-II

Q.3 a) Explain the mutagenic effect of base analog 5 bromo-uracil. **(06)**

OR

How does ultraviolet light produce reversible mutations?

b) Attempt any **TWO** of the following: **(10)**

- i)** Explain catalytic RNA giving suitable examples.
- ii)** Explain the role of t-RNA in protein synthesis
- iii)** Explain briefly "Chromosome banding".

Q.4 Attempt any **FOUR** of the following: **(16)**

- i)** Explain the structure and the role of telomere.
- iii)** State the important features of the genetic code.
- iii)** Write all possible anticodons for codon "CUG". State nucleotides that determine the specificity of anticodons.
- iv)** Define:
 - i) Spontaneous mutation
 - ii) Transition mutations
 - iii) Non-sense mutations
 - iv) Missense mutations

Q.5 Write short notes on any **FOUR** of the following: **(16)**

- a)** Ethidium bromide
- b)** Bacterial nucleoid
- c)** C-value paradox
- d)** Physical mutagenic agents
- e)** Repetitive sequences and their significance