3 (Sem–6) BOT M 1

2020

BOTANY

(Major)

Paper : 6·1

(Molecular Biology and Plant Biochemistry)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Answer the following questions as directed : 1×7=7

   (a) _____ system is an example where negative control of gene expression is illustrated. *(Fill in the blank)*

   (b) _____ is the amino acid which initiates the polypeptide chain in prokaryotic cells. *(Fill in the blank)*

(c) Why does mRNA not last long at all in prokaryotes ?

(d) The lac operon is a unit of _____ DNA.
(Fill in the blank)

(e) What is the full form of MVD ?

(f) The polysaccharide present in both, the cell wall of fungi and exoskeletons of arthopods is _____.
(Fill in the blank)

(g) Name the most extensively used chemical mutagen in microorganisms, higher plants and animals.

2. Answer the following in brief : 2×4=8

(a) Exons and Introns

(b) Monosaccharides

(c) Lac repressor

(d) Nonsense codon.

3. Write short notes on ***any three*** of the following : 5×3=15

(a) Role of Leghaemoglobin in biological N_2-fixation

(b) Base Analogues

(c) Difference between B-DNA and Z-DNA

(d) Structure of gene

(e) Justify the statement—"Enzymes are biological catalyst".

4. Answer ***any three*** of the following: 10×3=30

(a) What do you mean by semi-conservative replication. Give an account of the process of DNA replication in *E.coli.* 2+8=10

(b) What is regulator gene? Give an account of the 'Lac Operon Model' for regulation of gene activity. 2+8=10

(c) Define enzyme Nitrogenase. What are its different components? Explain the mechanism of action of the enzyme in different biological systems. 1+3+6=10

(d) What are the different kinds of RNA found in cell? Describe the characteristics and functional role of each of them. 2+8=10

(e) Is point mutation always damaging? What are the causes of point mutation? Explain with the help of example. 2+8=10

(f) Explain the "central dogma of life". Why is it important in molecular biology and genetics? 10