

Total number of printed pages-4

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)*

*Contd.*



(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 arthropods 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:  $2 \times 4 = 8$

(a) Exons and Introns

(b) Monosaccharides

(c) Lac repressor

(d) Nonsense codon.

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

(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:  $10 \times 3 = 30$

(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?  $10$