

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 :

10×3=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?  $10$