

2018

BOTANY

(Major)

Paper : 6.1

(Molecular Biology and Plant Biochemistry)

Full Marks : 60

Time : 3 hours

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

1. Fill in the blanks with appropriate words :

1×7=7

(a) In 1960, _____ discovered flip-flop and lateral diffusion of phospholipids in cell membrane.

(b) In translation process, the enzyme _____ helps the peptide bond formation between two amino acids.

(c) An operon contains multiple genes under the control of one _____.

(d) The unit of DNA in which individual acts of replication occur is called the _____.

- (e) The enzyme binds with the reactants and brings them very close and in proper orientation so that the reacting groups may easily react. This effect is known as ____.
- (f) Fructose 1, 6-biphosphate is cleaved into two three carbon molecules in the presence of ____ enzyme.
- (g) Pyrimidine dimers are formed as a result of ____ radiations.

2. Define the following in brief :

2×4=8

- (a) Nitrogenase enzyme
- (b) Exons
- (c) Base analogues
- (d) DNA priming

3. Write short notes on any *three* of the following :

5×3=15

- (a) Degeneracy of the genetic code
- (b) Exo and endo forms of monosaccharides
- (c) Fine structure of a gene
- (d) Frameshift mutation

4. Answer any *three* of the following : $10 \times 3 = 30$

- (a) Describe RNA polymerase and the initiation of RNA synthesis in prokaryotes. What are factor dependent method and intrinsic termination method?
- (b) Explain free energy change and reaction equilibrium of enzyme action. Define action site of the enzyme.
- (c) Define inducible system. Discuss the 'lac operon' gene expression and regulation in prokaryotes. $2+8=10$
- (d) What is biological nitrogen fixation? Describe the process of root nodule formation. What is conformational and respiratory protection of nitrogenase enzyme?
- (e) Distinguish between disaccharides and polysaccharides. Discuss in detail about the structure and formation of polysaccharides. $2+8=10$

★ ★ ★