

1 (Sem-5/FYUGP) BOT 42 MJ

2025

BOTANY

(Major)

Paper : BOT0500204

(Molecular Biology)

Full Marks : 45

Time : 2 hours

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

1. Answer the following as directed : 1×5=5

(a) The triplet letter genetic code represents

- (i) enzyme
 - (ii) protein
 - (iii) amino acid
 - (iv) both enzyme and protein
- (Choose the correct option)

(b) D-form DNA is

- (i) left handed coiled
 - (ii) right handed coiled
 - (iii) linear straight
 - (iv) None of the above
- (Choose the correct option)

(2)

- (c) Exons are
- (i) inactive genes
 - (ii) active genes
 - (iii) both active and inactive genes
 - (iv) None of the above
- (d) Viruses are made of _____ or _____.
(Fill in the blanks)
- (e) Name the organelle found in both prokaryotic and eukaryotic cell.

2. Answer any *five* of the following questions :

2×5=10

- (a) What is the difference between protoplasm and cytoplasm?
- (b) What are chromomeres?
- (c) What is genetic code?
- (d) What is the difference between hnRNA and mRNA?
- (e) Why is DNA negatively charged?
- (f) What are heat shock proteins?

(3)

- (g) Why tryptophan operon is a repressible operon?
- (h) What is a TATA box?
- (i) What is Lac operon?
- (j) What do you mean by cot curve?

3. Answer any *four* of the following questions :

5×4=20

- (a) What is deciphering of genetic code?
- (b) Explain about the functions of the different types of enzymes involved in B-form DNA replication.
- (c) Write briefly about the different types of polymerase enzymes.
- (d) Write the difference between constitutive and facultative heterochromatin.
- (e) Write briefly about split genes.
- (f) Enumerate about the experiment which proved DNA as a carrier of genetic information.
- (g) Write a short note on riboenzymes.
- (h) Write about adopter hypothesis and discovery of mRNA template.

(4)

4. Answer any one of the following questions : 10
- (a) What is an operon? Describe the concept of Lac operon in prokaryotes with a neat diagram. 2+8=10
- (b) Describe the mechanism of transcription in eukaryotes. 10
- (c) Describe the semi-conservative mode of linear DNA replication. 10
- (d) Write about the various steps involved in the translation process of protein synthesis in prokaryotes. 10
