

Total number of printed pages-4

3 (Sem-4/CBCS) BOT HC 1

2021

BOTANY

(Honours)

Paper : BOT-HC-4016

(Molecular Biology)

Full Marks : 60

Time : Three hours

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

GROUP-A

(Marks : 30)

1. Answer the following questions : $1 \times 5 = 5$

(a) Who proved that DNA is the basic genetic material ?

Contd.

- (b) Define Viral Genome.
- (c) Is DNA replication semi-discontinuous or discontinuous ?
- (d) What are Spliceosomes ?
- (e) Why is lac operon inducible ?
2. Answer the following briefly : $2 \times 5 = 10$
- (a) What did Fraenkel-Conrat discover ?
- (b) Do you agree that Theta replication is unidirectional ? Give reasons.
- (c) Differentiate between Facultative and Constitutive heterochromatin.
- (d) What is a trp repressor ?
- (e) What are structural proteins ?
3. Write notes on **any three** of the following : $5 \times 3 = 15$
- (a) Adapter Hypothesis
- (b) Genetic Code

- (c) Nucleosomes
- (d) Gene silencing
- (e) Fidelity of translation.

GROUP-B

(Marks : 30)

4. Answer **any three** of the following : (Within **800** words)

(a) Describe in detail, the three major phases of the mechanism of transcription in prokaryotes. 10

(b) What is positive and negative gene regulation ? Explain with the help of diagram, the mechanism involved in the positive control system for regulation of gene activity in *E. coli* lac operon.

3+7=10

(c) "DNA replication is a biological process that occurs in all living organisms." Elucidate on the characteristics of replication and their patterns. 10

- (d) Discuss the steps involved in mRNA processing. Why is mRNA processing important for eukaryotes ? 6+4=10
- (e) "The shape of a Cot curve for a given species is a function of two factors." Explain. 10
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