

B.Sc. 4th Semester (Honours) Examination, 2023 (CBCS)**Subject : Botany****Course : CC-X****(Molecular Biology)****Time: 2 Hours****Full Marks: 40**

*The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words
as far as practicable.*

1. Answer *any five* questions from the following: 2×5=10
 - (a) What are ribozymes?
 - (b) What is post-translational modification of protein?
 - (c) State Chargaff's rule.
 - (d) What is heat shock protein?
 - (e) Mention two bacterial features of mitochondrial DNA.
 - (f) Name one molecular chaperone. State one major function of chaperone.
 - (g) Mention the role of guide RNA in RNA editing.
 - (h) Name two inhibitors of protein synthesis.

2. Answer *any two* questions from the following: 5×2=10
 - (a) What was the inference of Avery-MacLeod-McCarty's experiment? Describe Hershey-Chase experiment to prove that DNA is the genetic material. 1+4
 - (b) Mention the properties of genetic code. What is reverse transcription? 4+1
 - (c) Schematically describe eukaryotic mRNA processing.
 - (d) Describe the role of Golgi apparatus in protein glycosylation.

3. Answer *any two* questions from the following: 10×2=20
 - (a) Mention the names and functions of the enzymes and proteins involved in bacterial DNA replication. What do you mean by semiconservative DNA replication? 4+4+2
 - (b) Describe nucleosome model with labelled diagram. Distinguish between constitutive and facultative heterochromatin. 4+4+2

- (c) What is operon? What are the structural genes present in 'lac' operon? State their functions.
What is attenuation in 'trp' operon? 1+5+4
- (d) Briefly describe the initiation and rho —independent termination of transcription in bacteria. What is 'TATA' box? 4+4+2