

B.Sc. 5th Semester (Honours) Examination, 2022 (CBCS)

Subject : Zoology

Course : CC-XI

(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.*

Group-A

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

2×5=10

- (a) What are Okazaki fragments?
- (b) Comment on structure of telomere.
- (c) What is the function of Rec A protein?
- (d) DNA replication is semidiscontinuous —explain.
- (e) Write a short note on TATA box.
- (f) What is RT-PCR?
- (g) Define RNA-editing.
- (h) Genetic code is degenerative —Explain.

Group-B

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

5×2=10

- (a) Distinguish between repressible operon and inducible operon with suitable examples. 5
- (b) Write a short note on Southern blotting. 5
- (c) Narrate the possible mechanism of in RNA mediated inhibition of protein synthesis. 5
- (d) Interaction of general transcriptional factors with the promoter region of mRNA is very important for successful transcription— discuss. 5

Group-C

3. Answer any two questions of the following:

10×2=20

- (a) Describe how initiation of DNA replication takes place in prokaryotes. Explain the mechanism of lagging strand synthesis during replication with suitable diagram. What do you mean by RNA priming? 4+4+2=10
- (b) Explain why *lac I^s* mutants of *E.coli* are *cis* dominant to wild type *lac I⁺* but *lac I⁻* mutants are recessive to both *I^s* and *I⁺*? Discuss the control circuit for the *lac* operon with sketch diagram. 5+5=10
- (c) Describe the mechanism of the initiation of protein synthesis in prokaryotes. Add a note on steps of peptide chain elongation in prokaryotes. Mention the role of different factors in termination step of protein synthesis. 4+4+2=10
- (d) Comment on capping and Poly Adenylation of RNA. Describe the Spliceosome-mediated splicing mechanism of pre-mRNA. Mention the significance of alternative splicing. 3+4+3=10