

B.Sc. 5th Semester (Honours) Examination, 2024 (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.*

1. Answer any five questions:

2×5=10

- (a) What do you mean by hypsochromic shift?
- (b) Specify the function of topoisomerase-II.
- (c) Comment on epigenetic regulation.
- (d) State the significance of Wobble hypothesis.
- (e) Decode 'SOS' repair. Why is it named so?
- (f) Write the function of CPSF.
- (g) Mention the role of 'Lex A' repressor in SOS repair.
- (h) How many nucleotides would you expect to be present in a three turn dsDNA piece?

2. Answer any two questions:

5×2=10

- (a) Draw and represent the chemical structure of a deoxyribonucleotide. Mention its chemical name. **4+1**
- (b) Describe the process of tRNA charging.
- (c) Describe the steps of mRNA capping. Comment on cap snatching. **4+1**
- (d) Elaborate the steps of miRNA mediated gene silencing.

3. Answer any two questions:

10×2=20

- (a) Describe the initiation of replication in prokaryote. Comment on TUS-TER complex. **7+3**
- (b) What is the effect of LacI^{-d} mutation? With proper illustrations enumerate the role of leader sequence in regulating trp operon. Add notes on Histone methylation and acetylation.

2+4+(2+2)

(c) What is RT-PCR? Narrate the phases of PCR cycle with suitable illustrations. Mention the code for 'Amber', 'Ochre', 'Opal'. Comment on Degeneracy of Genetic code. 1+4+3+2

(d) Write short notes on (*any two*):

5×2

(i) Role of alternative splicing

(ii) T_S-T_u cycle in translation

(iii) Puromycin as potent inhibitor in translation

(iv) Significance of genetic imprinting
