

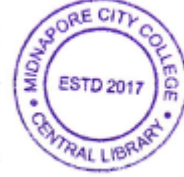
2025

5th Semester Examination (CCFUP : NEP)

ZOOLOGY

Paper : MJ 8-T (Single Core Major)

[Molecular Biology]



Full Marks : 40

Time : Two Hours

*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**

Answer any *five* questions : 2×5=10

1. What is Chargaff's rule?
2. What is Okazaki fragment?
3. What is meant by split gene?
4. State the position and function of Shine-Dalgarno sequence.
5. Write down the function of RecBCD?
6. Write the significance of histone acetylation.

P.T.O.



7. If one DNA sample contains 28% adenine, what would be the percentage of guanine?

8. Why cycloheximide is considered as a translation inhibitor?

Group - B

Answer any four questions : 5×4=20

9. Briefly describe the initiation process of DNA replication in prokaryotes.

10. What is attenuator? Explain with diagram the mechanism of tryptophan operon regulation by attenuation. 2+3

11. Why SOS response is also known as error-prone repair? Write down the steps of base excision repair. 2+3

12. Give a schematic representation of spliceosome-mediated splicing. What is exon shuffling? 4+1

13. Describe the steps of tRNA charging with a clear diagram. What do you mean by degeneracy of genetic code? 3+2

14. Describe the mechanism of attenuation of trp operon with suitable diagram. What is catabolite activator protein? 4+1

Group - C

Answer any one question : 10×1=10

15. What is end replication problem? How this problem is addressed in stem cells? Write down the significance of



sliding clamp in DNA replication. State the function of topoisomerase and helicase enzymes. 2+4+2+2

16. (a) Draw and describe a simplified model of intron removal by the spliceosome.

(b) Discuss the mechanism of Rho-mediated transcription termination with a suitable diagram. 6+4

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$$\begin{array}{r} 28 + x = 1 \\ \underline{50} \\ 28 + x = 50 \\ x = 50 - 28 \\ x = 22 \end{array}$$