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B.Sc./5th Sem (H)/ZOOL/23(CBCS)

2023

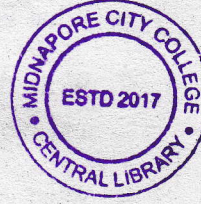
5th Semester Examination

ZOOLOGY (Honours)

Paper : C 11-T

(Molecular Biology)

[CBCS]



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 : $2 \times 5 = 10$

1. Write the significance of histone acetylation in the context of gene regulation.
2. Differentiate between holoenzyme and core enzyme of RNA polymerase.
3. What do you mean by proofreading activity of DNA polymerase?
4. What is mismatch repair of DNA?

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5. A segment of DNA has 120 adenine and 120 cytosine bases. What is the total number of nucleotides present in the segment?
6. What is Chargaff's rule?
7. Write down any two differences between Southern Blot and Northern Blot.
8. What is the significance of methyl capping in mRNA?

Group - B

Answer any *four* questions : $5 \times 4 = 20$

9. What is alternative splicing? Write down its significance in the context of Drosophila sex determination. Write down the difference of miRNA and siRNA function. 1+3+1
10. What is the difference between transition and transversion mutation? Write a short note on mismatch of DNA. Give diagram, if applicable. 2+3
11. Write down the functions of DNA polymerase I, DNA ligase, SSBP, DNA gyrase and RNA primase in DNA replication of Prokaryotes. 1+3+2
12. Differentiate between prokaryotic and eukaryotic transcription. State briefly on the 5' and 3' modification of mRNA. 3+2

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13. Write a short note on nucleotide excision repair mechanism. What is the role of pribnow box? 4+1
14. Illustrate the process of charging of tRNA during translation in prokaryotes. What is gRNA? 4+1

Group - C

Answer any *one* question : $10 \times 1 = 10$

15. If DNA polymerase I were muted so that all its enzymatic activities were inactive, which part of replication could be most affected? Write down the steps of DNA replication on the lagging strand. What do you mean by end replication problem? Where does it found? 2+5+2+1
16. Mention any two applications of Western Blotting techniques. Briefly describe rho-independent termination of transcription. Why is DNA replication semi-conservative? Discuss with a proof. 2+3+5