K25U 0189

Reg. No. : .....

Name : .....

Sixth Semester B.Sc. Degree (CBCSS – OBE – Regular/Supplementary/ Improvement) Examination, April 2025
(2019 to 2022 Admissions)
CORE COURSE IN ZOOLOGY
6B10 ZLG : Molecular Biology and Bioinformatics

Time : 3 Hours Max. Marks : 40

I. Essay questions. **Each** question carries **8** marks. Answer **any two.**

1) Discuss Nucleosome structure and packaging of DNA into higher order structures.
2) Explain in detail with diagram, the 'Watson and Crick model of DNA structure'.
3) Describe in detail about the DNA repair mechanisms in prokaryotes.
4) Give a detailed description about principle, procedure and applications of any two DNA sequencing methods. **(2×8=16)**

II. Short essay questions. **Each** question carries **4** marks. Answer **any two.**

5) Describe the Hershey and Chase experiment and explain how it confirmed DNA as the genetic material.
6) Write a brief account on the transcription in eukaryotes.
7) Describe the Needleman-Wunsch and Smith-Waterman algorithms for sequence alignment and highlight their differences. **(2×4=8)**

III. Short answer questions. **Each** question carries **2** marks. Answer **any six.**

8) Write any four characteristics of genetic code.
9) Discuss the concept of *lac-operon.*
10) Explain the method of isoelectric focussing and its significance.
11) What is the scope of Bioinformatics in modern biology ?

P.T.O.

12) Give a brief account on capping and tailing of mRNA.
13) What are BAC and YAC ? Add note on its application.
14) Differentiate between primary and secondary databases in Bioinformatics.
15) Explain lysogenic mechanism. **(6×2=12)**

IV. Multiple choice questions. **Each** question carries **0.5** marks. Answer **all.**

16) Which scientist's experiment demonstrated bacterial transformation ?
a) Griffith b) Hershey and Chase
c) Meselson and Stahl d) Watson and Crick

17) What is the genetic material in retroviruses ?
a) DNA b) RNA
c) Nucleic acid d) Nucleoprotein

18) What is the modern concept of a gene ?
a) Muton b) Recon c) Cistron d) All of the above

19) What structure packages DNA into higher-order structures ?
a) Chromosome b) Chromatid
c) Chromatin d) Nucleosome

20) Which of the following forms of DNA is left-handed ?
a) A-DNA b) B-DNA c) C-DNA d) Z-DNA

21) Which enzyme is not involved in DNA replication ?
a) Helicase b) Ligase
c) Topoisomerase d) Peptidase

22) Which method is used for local sequence alignment ?
a) BLAST b) CLUSTAL
c) Needleman-Wunsch d) Smith-Waterman

23) What does a microarray measure ?
a) Protein structure b) Gene expression
c) Metabolite levels d) DNA repair **(8×0.5=4)**

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