



Avinashilingam Institute for Home Science and Higher Education for Women

Deemed to be University Estd. u/s 3 of UGC Act 1956, Category A by MHRD (now MoE)

Re-accredited with A++ Grade by NAAC. CGPA 3.65/4, Category I by UGC

Coimbatore - 641 043, Tamil Nadu, India

Master's Degree Examination – May 2025 II Semester

Class : I P.G.
Major : Zoology

Time: 3 Hours
Max. Marks: 100

23MZOC10 Bioinformatics

Course Outcomes:

CO1: Locate and use the main databases at the NCBI and EBI resources and know the difference between databases, tools, repositories and be able to use each one to extract specific information

CO2: Extract data from specific databases using accessions numbers and gene names

CO3: Able to perform simple genome sequence analyses using existing tools

CO4: Interpret correctly the outputs from tools used to analyse biological data and make meaningful predictions from these outputs.

CO5: Able to describe and comprehend the fundamental concepts of molecular modelling and computational driven drug discovery

Part A

10 x 1 = 10

Choose the Correct Answer

1. Which of the following is a widely used sequence alignment tool? CO1K1
a. BLAST b. PCR c. ELISA d. NMR
2. Select the programming language that is commonly used to process FASTA files CO1K1
a. HTML b. Python c. JavaScript d. CSS
3. The scoring matrix that is commonly used for protein sequence alignment is CO2K1
a. PAM b. BLOSUM c. ClustalW d. FASTA
4. Choose the algorithm that is used for multiple sequence alignment? CO2K3
a. BLAST b. FASTA c. ClustalW d. DotPlot
5. ENCODE is stands for..... CO3K4
a. Encyclopedia of DNA Components b. Encyclopedia of DNA Elements
c. Essential DNA Coding Elements d. Extended Nucleotide Coding
6. Which of the following is the purpose of SNP analysis? CO3K1
a. Protein folding b. Evolutionary analysis
c. Gene cloning d. RNA sequencing
7.technique used for protein sequencing. CO4K1
a. PCR b. MALDI-TOF c. Sanger Sequencing d. qRT-PCR
8. method is commonly used for protein structure prediction. CO4K2
a. Ramachandran Plot b. Threading c. BLAST d. FASTA
9. Which following technique is used for gene expression analysis? CO5K1
a. MALDI-TOF b. RNA-seq c. CRISPR d. PCR
10. Which of the following is a model organism used in functional genomics? CO5K1
a. E. coli b. Arabidopsis c. Drosophila d. All of the above

Part B**5 x 6 = 30****Answer ALL questions****Each answer should not exceed 400 words or two pages**

- 11.a. Write a short note on the role of NCBI in bioinformatics. CO1K3
(or)
- 11.b. Explain the significance of FASTA format. CO1K2
- 12.a. Define homology, similarity, and identity in sequence alignment. CO2K1
(or)
- 12.b. Summarize the role of phylogenetic tree building in bioinformatics. CO2K5
- 13.a. Explain the Human Genome Project and its significance in medical research. CO3K4
(or)
- 13.b. Discuss the role of Next Generation Sequencing for molecular diagnosis. CO3K2
- 14.a. Discuss the role of gel electrophoresis in proteomics. CO4K5
(or)
- 14.b. Explain the significance of the Ramachandran plot in protein structure prediction. CO4K3
- 15.a. Write about Microarray technology and its applications. CO5K3
(or)
- 15.b. State the key features of Zebra fish as model organisms in genomics. CO5K1

Part C**5 x 12 = 60****Answer ALL questions****Each answer should not exceed 800 words or four pages**

- 16.a. Explain different nucleotide sequence databases with examples. CO1K4
(or)
- 16.b. List the applications of bioinformatics in clinical informatics. CO1K1
- 17.a. Discuss methods of pairwise sequence alignment. CO2K2
(or)
- 17.b. Write an account on multiple sequence alignments CLUSTALW. CO2K2
- 18.a. Differentiate the key features of Eukaryotic, Bacteria and Archaea genomes. CO3K4
(or)
- 18.b. Summarize the significance of genome browsers in genomics research. CO3K2
- 19.a. Compare the different protein sequencing techniques. CO4K5
(or)
- 19.b. Discuss the process of protein structure prediction and its applications. CO4K2
- 20.a. Write an account on SAGE and RNA seq. CO5K3
(or)
- 20.b. Point out the significance of E.Coli and Arabidopsis thaliana. CO5K4
