

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI –600 086**  
(For candidates admitted from the academic year 2023 – 2024)

**M. Sc. DEGREE EXAMINATION, APRIL 2024**  
**BIOINFORMATICS**  
**SECOND SEMESTER**

**COURSE : CORE**  
**PAPER : GENOMICS AND TRANSCRIPTOMICS**  
**SUBJECT CODE : 23BI/PC/GT24**  
**TIME : 90 MINUTES** **MAX. MARKS: 50**

<b>Q. No.</b>	<b>SECTION A (10 x 1=10 marks)</b> <b>All questions to be answered (Objective type)</b>	<b>CO</b>	<b>KL</b>
1	Define Comparative genomics.	CO1	K1
2	Expand BAM.	CO2	K2
3	Define the basic principle of GWAS?	CO1	K1
4	List out the 3 types of epigenetics?	CO2	K2
5	What are three types of genome editing techniques?	CO1	K1
6	How will you utilize the function of sgRNA in Cas9 complex?	CO2	K2
7	Name any three advantages of SAGE technique?	CO1	K1
8	Expand RIN.	CO2	K2
9	List out the importance of KEGG pathway enrichment analysis?	CO1	K1
10	Summarize about Bowtie software.	CO2	K2
<b>Q. No.</b>	<b>SECTION B (10 x 2= 20 marks)</b> <b>Answers in about 50 words</b>	<b>CO</b>	<b>KL</b>
11	Organize the methodology shotgun sequencing of bacterial genome?	CO3	K3
12	Categorize the steps in finding the sequence of a gene.	CO4	K4
13	Discuss about rarefaction curve in biodiversity.	CO3	K3
14	Summarize about beta diversity in microbiome.	CO4	K4
15	What is TALENs used for?	CO3	K3
16	How do ZFNs bind to DNA?	CO4	K4
17	Comment on R packages used for DEG analysis.	CO3	K3
18	List out the function of siRNA.	CO4	K4
19	Categorize the main functions of FastQC.	CO3	K3
20	Compare scaffold and contig.	CO4	K4
<b>Q. No.</b>	<b>SECTION C (4 x 5= 20 marks)</b> <b>Answer in about 600 words - Internal choice</b>	<b>CO</b>	<b>KL</b>
21	a) Explain the methodology of Denova sequence genome assembly?  <b>OR</b> b) Elaborate the Metagenomics sequencing workflow.	CO5	K5
22	a) Discuss the major steps in CRISPR genome editing.  <b>OR</b> b) Explain in detail about Genome editing in plant disease resistance: applications and perspectives.	CO5	K6

23	a) List out the steps of RNA sequencing analysis. <b>OR</b> b) Briefly discuss the steps involved in cDNA based Microarray.	CO5	K5
24	a) Assess the steps in FASTQ Quality Check <b>OR</b> b) Elaborate on STRING: functional protein association networks.	CO5	K6

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