

Registration Number:

Date & session:



**ST. JOSEPH'S UNIVERSITY, BENGALURU -27**  
**BDA (BIG DATA ANALYTICS) – III SEMESTER**  
**SEMESTER EXAMINATION: OCTOBER 2023**  
**(Examination Conducted in November/December 2023)**  
**BDADE 3621 – BIOINFORMATICS**  
**(For current batch students only)**

**Time: 2 Hours**

**This paper contains TWO printed pages and THREE parts**

**Max Marks: 50**

**PART A**

**Answer All the Questions**

**5 X 2 =10**

- 1 What are the functions of the cell?
- 2 What is the central dogma of molecular biology?
- 3 Describe briefly the applications of sequence alignment.
- 4 Name the amplification methods used in Roche and Illumina technologies.
- 5 Name any two tools used for the alignment of NGS sequences.

**PART B**

**Answer any FIVE questions**

**5 X 4 =20**

- 6 What is PDB and discuss its importance.
- 7 What are the techniques involved in the Human Genome Project?
- 8 What is the role of a Data Analyst in Bioinformatics?
- 9 Write a note on various types of BLAST.
- 10 Differentiate between RefSeq and GenBank databases.
- 11 What is a FASTA format? How do we obtain the gene sequence in FASTA format using NCBI Gene?
- 12 What are the applications of multiple sequence alignment? Write a note on the usage of ClustalOmega.

**PART C**

**Answer Any TWO questions**

**2 X 10 =20**

- 13.(a) What is reference assembly? Discuss in detail the methodology of NGS technologies. 5
- 13.(b) Suggest a broad strategy for developing a computational method: There are 100 DNA samples from normal individuals and another 100 from patients with a genetic disorder. How would you compare the two sets of genomic DNA and find any existing difference that is associated with the specific genetic disorder? 5

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|--------|---|----|
| 14.(a) | Define genomics, transcriptomics, and proteomics along with their applications.           | 6  |
| 14.(b) | Write a note on various types of high-throughput data that are generated in these fields. | 4  |
| 15.(a) | Describe the homology modeling of protein structure. What are its applications?           | 10 |