

**PSG COLLEGE OF ARTS & SCIENCE**  
(AUTONOMOUS)

**MSc DEGREE EXAMINATION DECEMBER 2024**  
(Third Semester)

Branch - **BIOCHEMISTRY****MAJOR ELECTIVE COURSE – I BIOINFORMATICS**

Time: Three Hours

Maximum: 75 Marks

### **SECTION-A (10 Marks)**

Answer **ALL** questions

**ALL** questions carry **EQUAL** marks

$$(10 \times 1 = 10)$$

| Module No. | Question No. | Question                                                                                                                                                                                                                                                                                                            | K Level | CO  |
|------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| 1          | 1            | Which function is used by perl for displaying the length of a string?<br>a) String      b) Len      c) Split      d) Length                                                                                                                                                                                         | K1      | CO1 |
|            | 2            | What is the core of the Linux operating system?<br>a) Vi Editor      b) Command Line      c) Terminal      d) Kernel                                                                                                                                                                                                | K2      | CO1 |
| 2          | 3            | Which of the following is a protein sequence database?<br>a) DDBJ      b) EMBL      c) GenBank      d) PIR                                                                                                                                                                                                          | K1      | CO2 |
|            | 4            | A comprehensive database for the study of human genetics and molecular biology is ____<br>a) PDB      b) STAG      c) OMIM      d) PSD                                                                                                                                                                              | K2      | CO2 |
| 3          | 5            | BLAST stands for ____<br>a) Basic local assignment search tool<br>b) Bayes local alignment search tool<br>c) Basic level assignment search tool<br>d) Basic local alignment search tool                                                                                                                             | K1      | CO3 |
|            | 6            | A motif is often represented by a graphic representation called a ____<br>a) Logo      b) motto      c) algorithm      d) algo                                                                                                                                                                                      | K2      | CO3 |
| 4          | 7            | The identification of drugs through the genomic study is called ____<br>a) Genomics      b) Pharmacogenomics<br>c) Pharmacogenetics      d) Cheminformatics                                                                                                                                                         | K1      | CO3 |
|            | 8            | Which of the following statements about DNA sequencing is incorrect?<br>a) Sanger method is now used on a regular basis<br>b) DNA polymerases are not used in this method<br>c) This involves the construction of DNA chains of various lengths<br>d) Dideoxy nucleotides are used to stop DNA synthesis            | K2      | CO3 |
| 5          | 9            | NMR spectroscopy is used for determining structure in which of the following materials?<br>a) Radio- active materials      b) insoluble chemical compounds<br>c) Liquids      d) Gases                                                                                                                              | K1      | CO4 |
|            | 10           | Choose the correct statement.<br>a) Conformation of proteins depends only on environmental factors<br>b) Conformation of proteins is affected by environmental factors<br>c) Conformation of proteins does not depends on environmental factors<br>d) Conformation of proteins depends only on amino acid sequence. | K2      | CO3 |

**Cont...**

**SECTION - B (35 Marks)**Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

| Module No. | Question No. | Question                                                                             | K Level | CO  |
|------------|--------------|--------------------------------------------------------------------------------------|---------|-----|
| 1          | 11.a.        | What is Linux? Explain its importance in bioinformatics.                             | K2      | CO1 |
|            |              | (OR)                                                                                 |         |     |
|            | 11.b.        | How schrodinger software is used in drug discovery?                                  |         |     |
| 2          | 12.a.        | Discuss the scope of Human Genome Project.                                           | K3      | CO2 |
|            |              | (OR)                                                                                 |         |     |
|            | 12.b.        | What are the features of Entrez database?                                            |         |     |
| 3          | 13.a.        | Compare pairwise alignment and multiple sequence alignment.                          | K3      | CO3 |
|            |              | (OR)                                                                                 |         |     |
|            | 13.b.        | Explain the working of BLAST in sequence alignment.                                  |         |     |
| 4          | 14.a.        | How does pharmacogenomics function?                                                  | K4      | CO4 |
|            |              | (OR)                                                                                 |         |     |
|            | 14.b.        | What are the advantages of metabolomics over the other omics in studying metabolism? |         |     |
| 5          | 15.a.        | Discuss Ab initio methods for protein structure prediction.                          | K4      | CO4 |
|            |              | (OR)                                                                                 |         |     |
|            | 15.b.        | Discuss energy minimization in simulations.                                          |         |     |

**SECTION -C (30 Marks)**Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

| Module No. | Question No. | Question                                                                        | K Level | CO  |
|------------|--------------|---------------------------------------------------------------------------------|---------|-----|
| 1          | 16           | Examine the Systems Biology Mark up languages (SBML).                           | K4      | CO1 |
| 2          | 17           | Discuss the importance of biological databases in bioinformatics.               | K4      | CO2 |
| 3          | 18           | Illustrate Global alignment with a suitable example.                            | K4      | CO3 |
| 4          | 19           | Discuss gene prediction tool with respect to PCR.                               | K5      | CO4 |
| 5          | 20           | Explain the principle and working of in silico 3D protein structure prediction. | K5      | CO4 |

Z-Z-Z

END