

**Avinashilingam Institute for Home Science and Higher Education for Women  
Coimbatore – 641 043  
Continuous Internal Assessment Test II– April 2025  
Semester - II**

**Class : I PG**

**Major : Bioinformatics**

**Max. Marks: 60**

**Time : 2 Hours**

**23MBIC09 – Structural Bioinformatics and R Programming**

- CO1.** Explain bonding and their arrangements in a molecules.  
**CO2.** Define the structure of carbohydrate, lipids and its importance  
**CO3.** Realize the structure of nucleic acids, proteins and its importance  
**CO4.** Describe the basic principles of experimental methods for the determination of macromolecules structure and use of different types of protein prediction tools  
**CO5.** Acquire the knowledge of R programming for data analysis and plotting

**Part – A**

**6 x 1 = 6**

**Choose the correct answer**

1. Which of the following is used to install packages in R\_\_\_\_\_ CO1K1  
(a) include() (b) library()  
(c) require() (d) install.packages()
2. Which function is used to read a CSV file into R\_\_\_\_\_ CO1K4  
(a) read.csv()  
(b) load\_csv()  
(c) read\_csv()  
(d) import.csv()
3. Positively charged basic amino acids are\_\_\_\_\_ CO4K1  
(a) Lysine and arginine (b) Lysine and asparagine (c) Glutamine and arginine (d) aspartic acid and glutamic acid
4. The secondary structure is primarily maintained by\_\_\_\_\_ CO2K2  
(a) Van der Waals force (b) hydrogen bonding  
(c) ionic bonding (d) covalent bond
5. Identify the complementary strand of the DNA primary structure ATGCCGATC. CO4K4  
a) AUGCCGAUC b) TACGGCTAG c) UACGGCUAG d) GATCGGCAT
6. Which of the following is not a nucleoside? CO4K2  
(a) uridine (b) cytidylic acid (c) thymidine (d) guanosine

**Part B**

**3 x 6 = 18**

**Answer the following**

**Answers should not exceed 200 words or one page**

7. a) Write a note on Protein-Protein interactions CO3K1  
(Or)
7. b) Give a note on the classification of amino acids. CO4K1
8. a) Comment on NMR spectroscopy. CO4K1  
(Or)
8. b) What is cryoelectron microscopy? Explain. CO3K2
9. a) Explain the importance of Ramachandran plot CO4K3  
(Or)
9. b) Write a note on HMM CO4K2

**Part C**

**3 x 12 = 36**

**Answer the following not exceeding 700 words or four pages**

10. a) Write a brief note on computational method of protein structure determination. CO4K2  
(Or)
10. b) Discuss the structural classification of protein CO3K2
11. a) Write a note on the factors determining protein folding. CO3K3  
(Or)
11. b) Explain in detail the structures of DNA. CO3K3
12. (a) Discuss detail on control structures in R. CO5K1  
(Or)
12. (b) Illustrate graphical representation of data in R. CO5K2