Reg. No ..... Name **24U338**

END SEMESTER EXAMINATION - OTOBER 2024

SEMESTER 3 : INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE - DATA SCIENCE

COURSE : **21UP3CRMCP9 : R PROGRAMMING AND MATHEMATICS FOR ARTIFICIAL INTELLIGENCE**

(For Regular 2023 Admission and Improvement/Supplementary 2022/2021 Admissions)

Time : Three Hours Max. Weightage: 30

PART A

Answer any 8

1. Discuss various variable assignment methods in R.
2. Write the symbolic form of the statement:
   If either Jerry takes calculus or Ken takes sociology, then Lima takes English
3. State the rank nullity theorem.
4. Define a scalar.
5. List the functions to generate binomial distribution.
6. Mention any two rules of inference.
7. List the common probability distributions used in R.
8. Give any two applications of PCA.
9. Write about lists in R.
10. Define hyperplane.

(1 x 8 = 8 Weight)

PART B

Answer any 6

11. Discuss the rules of inference.
12. Give the uses of different relational operators in R.
13. Differentiate between cbind() and rbind()
14. Discuss with examples matrix addition and subtraction.
15. State the importance of support vector machine (SVM).
16. Explain correlation coefficient with a simple example.
17. Explain briefly the concept of rank and nullity.
18. Write R program to create a vector using : operator and seq() function.

(2 x 6 = 12 Weight)

PART C

Answer any 2

19. Write a sample program to perform the calculator function using R constructs.
20. a) Define (using truth tables) the disjunction, conjunction, exclusive or, conditional, and biconditional of the propositions p and q.
    b) Give the solutions for the disjunction, conjunction, exclusive or, conditional, and biconditional of the propositions “I’ll go to the movies tonight” and “I’ll finish my discrete mathematics homework”.
21. Explain about Principal Component Analysis in detail.
22. Explain the functions used in any two methods of probability distribution in detail.

(5 x 2 = 10 Weight)