QP CODE: 23800327

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Reg No : .....

Name : .....

INTEGRATED PG DEGREE EXAMINATION, DECEMBER 2023

Third Semester

CORE - ICSC3CR3 - R PROGRAMMING AND MATHEMATICS FOR ARTIFICIAL INTELLIGENCE

INTEGRATED MSC COMPUTER SCIENCE-ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING & INTEGRATED MSC COMPUTER SCIENCE- DATA SCIENCE

2020 ADMISSION ONWARDS

8716316F

Time: 3 Hours Weightage: 30

Part A (Short Answer Questions)

*Answer any **eight** questions.*

*Weight **1** each.*

1. Write a program to find sum , mean and product of a vector in R using bulit -in functions.
2. How to use R as a calculator ?
3. Name the data organization techniques in R.
4. Write a program to find length of vector using length function in R.
5. Define sets and its representation techniques.
6. Check the argument is valid or not. If the argument is valid state the rule of inference used. “If you have a password, then you can log on to Facebook”. You cannot log on to Facebook”. Therefore − "You do not have a password "
7. What is meant by row equivalent linear systems?
8. What is meant by determinant and order of determinant?
9. What is meant by vector space and basis of a vector space?
10. What are the properties of PCA?

(8×1=8 weightage)

Part B (Short Essay/Problems)

*Answer any **six** questions.*

*Weight **2** each.*

11. Discuss the concept functions in R.

12. Dicuss the Algebraic Properties of sets in R .

13. Explain on Bar chart on pie chart in R.

14. Expalin the operations on relations.

15. Briefly explain vector scalar multiplication and its properties.

16. Find the adjoint of the following matrix A. AlsosShow that A .adj(A) = |A|.I

$$\begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$$

17. 1)Discuss echelon form of a matrix.
    2)Convert the following matrix into echelon form:

$$\begin{bmatrix} 3 & 2 & 1 \\ 2 & 1 & 1 \\ 6 & 2 & 4 \end{bmatrix}$$

18. What is correlation coefficient? Briefly describe its significance in correlation analysis.

(6×2=12 weightage)

Part C (Essay Type Questions)

*Answer any **two** questions.*

*Weight **5** each.*

19. Discuss Decision making statements in R.

20. Expalin on probability distributions in R.

21. What is support vector machine? How to implement SVM using python?

22. Find the eigen values and eigen vectors of the following matrix.

$$A = \begin{bmatrix} 5 & -2 \\ 9 & -6 \end{bmatrix}$$

(2×5=10 weightage)