

**END SEMESTER EXAMINATION : OCTOBER 2022****SEMESTER 3 : INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE**

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

*(For Regular - 2021 Admission)*

Time : Three Hours

**Max. Weightage: 30****PART A****Answer any 8 Questions**

1. List the functions to generate binomial distribution.
2. Give the syntax and elaborate each term in creating a non-linear least square test.
3. Differentiate between 'invalid values' and 'outliers'.
4. Define correlation coefficient.
5. Define factors.
6. Differentiate vectors and scalars.
7. Give the method used to handle missing data in R.
8. State what do you mean by a well-formed formula.
9. Define contradiction.
10. Explain the basic principle behind an SVM.

**(1 x 8 = 8 Weight)****PART B****Answer any 6 Questions**

11. State the importance of support vector machine (SVM).
12. Differentiate between integer and numeric objects in R with examples.
13. Translate each of these statements into logical expressions using predicates, quantifiers, and logical connectives.
  - a) No one is perfect.
  - b) Not everyone is perfect.
  - c) All your friends are perfect.
  - d) At least one of your friends is perfect.
14. Write a program in R to check whether the given year is leap year or not.
15. Briefly explain the creation of an array with example.
16. Describe gaussian elimination with an example.
17. Explain briefly the concept of rank and nullity.
18. Explain any one advanced matrix operation in detail.

**(2 x 6 = 12 Weight)****PART C****Answer any 2 Questions**

19. Explain the importance of data cleansing in detail.
20. a) State what does it mean for two propositions to be logically equivalent.

- b) Describe the different ways to show that two compound propositions are logically equivalent.
- c) Show in at least two different ways that the compound propositions  $\neg p \vee (r \rightarrow \neg q)$  and  $\neg p \vee \neg q \vee \neg r$  are equivalent
21. Explain about Principal Component analysis in detail.
22. Explain the logical operators in R with suitable examples.

**(5 x 2 = 10 Weight)**