Reg. No ..... Name **24U518**

END SEMESTER EXAMINATION - OCTOBER 2024

SEMESTER 5 : INTEGRATED M.Sc. PROGRAMME COMPUTER SCIENCE

COURSE : **21UP5CRMCP14 : PRINCIPLES OF MACHINE LEARNING**

(For Regular 2022 Admission and Supplementary 2021 Admissions)

Time : Three Hours Max.Weightage : 30

PART A

Answer any 8

1. Define the term 'evidence' in the concept of Bayes classification.
2. Define the term synapse in the context of a neural network.
3. List any two situations that would adversely affect the quality of data collected for learning.
4. State the library function to be imported in python for linear regression.
5. State the significance of 'weight' in a neural network.
6. State the significance of a positive coefficient in logistic regression.
7. A box contains playing cards of four suits - clubs, spades, diamonds and hearts which are shuffled and scattered inside the box. If a machine can recognize the colours and symbols of cards, suggest an algorithm that would help the machine to arrange each of these four types of cards together as four suits.
8. State the need of MLE in logistic regression.
9. List the parameter(s) to be estimated for a linear regression model.
10. List any two applications in which machine learning has proved to be worthier than human learning.

(1 x 8 = 8 Weight)

PART B

Answer any 6

11. Discuss the case of over-fitting a linear regression model.
12. Discuss briefly the strengths and weaknesses of Bayes classifiers.
13. Write detailed notes on Bayesian linear regression.
14. Discuss briefly the technique behind support vector machines.
15. With a diagram, explain the structure of a perceptron.
16. Explain how the holdout method is beneficial in training a model.
17. The foundation of machine learning started in the 18th and 19th centuries. Give a brief account of the evolution of machine learning technology.
18. Explain the concept of dummy variables in logistic regression.

(2 x 6 = 12 Weight)

PART C

Answer any 2

19. Explain the architecture and functioning of the McCulloch-Pitts neuron model.
20. Write short notes on:
    (a). PCA (b). SVD

21. Given below is a sample containing the attributes Years_of_Experience and Salary. Predict the salary of a person who has 15 years of experience.

Years_of_Experience	1	2	3	4	5	6	7	8	9	10
Salary	42000	48000	59000	68000	80000	92000	105000	120000	130000	142000

22. Elaborate on the various types of Bayesian models.

(5 x 2 = 10 Weight)