

FOURTH SEMESTER M.Sc. DEGREE EXAMINATION, APRIL 2024

(Regular/Improvement/Supplementary)

COMPUTER SCIENCE

FCSS4E04: ADVANCED MACHINE LEARNING

Time: 3 Hours

Maximum Weightage: 30

Section A: Short answer questions. Answer any *four* questions. Each carries *two* weightage.

1. Define Machine Learning.
2. What is dimensionality reduction?
3. Define model selection.
4. What are t-tests?
5. Comment on back propagation.
6. What are random variables?
7. Give a short note on linear discriminant analysis.

(4 × 2 = 8 weightage)**Section B: Short essay question. Answer any *four* questions. Each carries *three* weightage.**

8. Differentiate supervised, unsupervised and reinforcement learning.
9. Explain the various issues in decision tree learning.
10. What is clustering? Explain K means clustering algorithm with an example.
11. Discuss temporal difference learning with an example.
12. What is multi-layer perceptron? Explain how it solves XOR problem.
13. Differentiate between linear and logistic regression. Explain with example.
14. What are different methods used for feature selection?

(4 × 3 = 12 weightage)**Section C: Essay questions. Answer any *two* questions. Each carries *five* weightage.**

15. Find Eigen values and Eigen vectors for the given matrix:

$$\begin{pmatrix} 1 & 1 & 0 \\ -1 & -1 & 0 \\ -2 & -2 & 2 \end{pmatrix}$$

16. What is Bayesian learning? Explain how Bayesian learning impacts in machine learning.
17. Explain various learning techniques involved in unsupervised learning.
18. List and explain various activation functions used in neural networks.

(2 × 5 = 10 weightage)