

2025

M.Sc. 3rd Semester Examination

COMPUTER SCIENCE

Paper : COS - 303

(Machine Learning)

Full Marks : 25

Time : One Hour

*The figures in the margin indicate full marks.
Candidates are required to give their answers
in their own words as far as practicable.*

Group - A

Answer any *two* questions : $2 \times 2 = 4$

1. What is the difference between classification and regression?
2. What is the purpose of the activation function in a neural network?
3. Name two types of unsupervised learning algorithms.
4. Define a confusion matrix and its use in evaluating models.

Group - B

Answer any *two* questions : $4 \times 2 = 8$

5. Describe the steps involved in a typical machine learning workflow.

P.T.O.

6. What is bias-variance trade-off, and why is it important in ML? 2+2
7. Describe the structure of an artificial neuron and compare it with a biological neuron. 2+2
8. What are ensemble methods? Give two examples and their advantages. 2+2

Group - C

Answer any *one* question : 8×1=8

9. Calculate the Entropy of the following table *S* and information gain of outlook :

Outlook	Temperature	Humidity	Wind	Play Tennis
Sunny	Hot	High	Weak	No
Sunny	Hot	High	Strong	No
Overcast	Hot	High	Weak	Yes
Rain	Mild	High	Weak	Yes
Rain	Cool	Normal	Weak	Yes
Rain	Cool	Normal	Strong	No
Overcast	Cool	Normal	Strong	Yes
Sunny	Mild	High	Weak	No
Sunny	Cool	Normal	Weak	Yes
Rain	Mild	Normal	Weak	Yes
Sunny	Mild	Normal	Strong	Yes
Overcast	Mild	High	Strong	Yes
Overcast	Hot	Normal	Weak	Yes
Rain	Mild	High	Strong	No

(3)

10. Derive the logistic regression model equation. Explain the role of the sigmoid function in predicting probabilities. 8

Internal Assessment : 5 marks
