Indian Maaritime University

(A Central University, Govt of India)

End Semester Examinations – June 2025

Programme Name: B Tech (ME)

Semester: VI

Subject Code: UG11T4601

Subject Name: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Date: 30.05.2025	Max Marks: 70
Duration: 03 Hrs	Pass Marks: 35

General Instructions

(i) All Sections (A, B & C) are to be attempted.
(ii) Options, if any, are specified in respective section.
(iii) Scientific Calculator is permitted.

Section A

MCQs- All questions are compulsory. (10 X 1Mark =10 Marks)

1. Who is known as the inventor of Machine Learning?

a. Charles Babbage

b. John McCarthy

c. Arthur Samuel

d.Alan Turing

2. What is the basic building block of an Artificial Neural Network?
a. Neuron
b. Activation function
c. Gradient descent
d. Loss function

3. A two-person zero-sum game means that the

a) The sum of losses to one player is equal to the sum of gains to other
b) The sum of losses to one player is not equal to the sum of gains to other
c) No any player gains or losses
d) None of these

4.What is the heuristic function of greedy best-first search?

a) f(n) != h(n) b) f(n) < h(n)
c) f(n) = h(n) d) f(n) > h(n)

5. Which of the following does not fall under artificial intelligence applications?

a) Computer vision b) Natural Language Processing
c) Database Management System d) Virtual assistants

6. Which of the following is a categorical feature?

a. height of a person

b. price of petroleum

c. mother tongue of a person

d. Amount of rainfall in a day

7.What is the role of Axon in a biological neural network?

a) Transmit signals to other neurons b) Receive signals from other neurons
c) Store information d) Control muscle movement

8.What type of neural network is best for image processing?

a) Recurrent Neural Network (RNN)
b) Convolutional Neural Network (CNN)
c) Perceptron
d) GAN

9.What is the Naïve Bayes algorithm based on?

a) Decision trees b) Probability theory
c) Neural networks d) Clustering methods

10.AI-based predictive maintenance in ships helps in:

a) Reducing maintenance costs and preventing failures
b) Increasing ship size
c) Improving sailor training
d) Enhancing ship aesthetics

Section B

Five Questions of 02 Marks each

11. What is meant by Nash equilibrium in game theory?

12. Define labelled and unlabelled data with examples.

13. What is meant by FI-FO technique in search algorithm?

14. How do you compare the term soma and dendrites in ANN?

15. How do you measure machine learning model?

Section C

Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. a) Analyse the historical development of Artificial Intelligence and its impact over time.
b) Compare and contrast Weak AI and Strong AI, and evaluate which one is more feasible.
(5+5 marks)

17. Explain about game theory and its types.
(10Marks)

18. a) Explain about supervised and unsupervised machine learning methods.
(5 Marks)

b) What are the privacy concerns related to Artificial Intelligence? Explain them in detail.
(5 Marks)

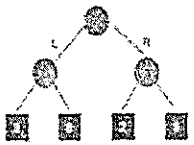
19. a) A shipping company wants to classify whether a received distress signal is a real emergency or a false alarm using the Naïve Bayes classifier. Based on historical data, the probabilities are given as follows:

P (Real Emergency) = 0.3, P (False Alarm) = 0.7,
P ("engine failure" | Real Emergency) =0.8,
P ("engine failure" | False Alarm) = 0.2.
(6 marks)

If a new distress signal contains the phrase "engine failure", what is the probability that it represents a real emergency? Use Bayes' theorem to calculate P (Real Emergency | "engine failure").

b) describe the following terms: Likelihood Ratio, Prior Probability, Posterior probability and Marginal Probability.
(4marks)

20. (a) Explain about search algorithms and its applications.
(b) Apply suitable algorithm in the given game tree and find the optimal path to maximize the benefits of player.



(5+5 marks)

21. (a) How do you compare Biological Neural Network(BNN) and Artificial Neural Network(ANN)
(b) Explain about activation function and weights in ANN
(5+5 marks)

22. Explain in detail about AI applications in maritime industry with suitable examples or case study.
(10 Marks)