

Indian Maritime University
(A Central University, Govt of India)

Supplementary Examinations – September/October 2024

Programme Name: B Tech (ME)

Semester: VI

Subject Code: UG11T4601

Subject Name: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Date: 24.10.2024

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

Ten MCQs/Fill in the Blanks of 01 Mark each – Choose the correct answer as applicable.

1. What is Artificial Intelligence?
(a) Artificial Intelligence is a field that aims to make humans more intelligent.
(b) Artificial Intelligence is a field that aims to improve the security.
(c) Artificial Intelligence is a field that aims to develop intelligent machines.
(d) Artificial Intelligence is a field that aims to mine the data.

2. Which of the following is the branch of Artificial Intelligence?

- (a) Machine Learning
- (b) Cyber forensics
- (c) Full-Stack Develop
- (d) Network Design

3. Who is known as the Father of AI?

- (a) Fisher Ada
- (b) Alan Turing
- (c) John McCarthy
- (d) Allen Newell

4. Among the given options, which search algorithm requires less memory?

- (a) Optimal Search
- (b) Depth First Search
- (c) Breadth First Search
- (d) Linear Search

5. Which algorithm is used in the Game tree to make decisions of Win/Lose?

- (a) Heuristic Search Algorithm
- (b) DFS/BFS Algorithm
- (c) Greedy Search Algorithm
- (d) Min/Max Algorithm

6. What is a perceptron in ANN?

- (a) A double layer auto-associative neural network
- (b) A neural network that contains feedback
- (c) An auto-associative neural network
- (d) A single layer feed-forward neural network with pre-processing

7. Choose the options below that do not fall within the category of Machine Learning:

- (a) Semi-unsupervised learning
- (b) Supervised learning
- (c) Reinforcement learning
- (d) Unsupervised learning

8. Which of the below models is a generative model used in machine learning?

- (a) Support vector machines
- (b) Naïve Bayes
- (c) Logistic Regression
- (d) Linear Regression

9. What is the key difference between supervised and unsupervised learning?

- (a) Supervised learning requires labelled data, while unsupervised learning does not.

- (b) Supervised learning predicts labels, while unsupervised learning discovers patterns.

- (c) Supervised learning is used for classification, while unsupervised learning is used for regression.

- (d) Supervised learning is always more accurate than unsupervised learning.

10. What is the formula for Bayes' theorem? Where (A & B) and (H & E) are events and $P(B)$, $P(H)$ & $P(E) \neq 0$.

- (a) $P(H|E) = [P(E|H) * P(H)] / P(E)$

- (b) $P(A|B) = [P(A|B) * P(A)] / P(B)$

- (c) $P(H|E) = [P(H|E) * P(H)] / P(E)$

- (d) $P(A|B) = [P(B|A) * P(A)] / P(B)$

Section B

Five Questions of 02 Marks each

11. Define the terms Weak and Strong AI with examples.

12. Give the difference between Machine Learning and Deep Learning.

13. What is 'Overfitting' in machine learning and how can you avoid?

14. What is an activation function in neural networks and different types.

15. What is Turing Test?

Section C

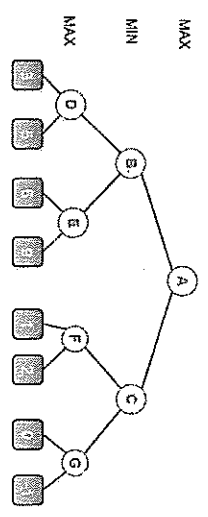
Seven Questions of 10 Marks each of which any 05 questions to be answered.

16. Discuss in details the historical evaluation of Artificial Intelligence. (10 Marks)

17. (a) Using Bayes' theorem, describe the following terms: Likelihood Ratio, Prior

Probability, Posterior probability and Marginal Probability. (4 Marks)
 (b) What is the probability that person has disease dengue with neck pain?
 Given: 80% of time dengue causes neck pain, $P(\text{dengue}) = 1/30,000$
 and $P(\text{neck pain}) = 0.02$. (6 Marks)

18. (a) Explain the Mini-Max algorithm. (5 Marks)
 (b) Apply the minimax search algorithm and find the most convenient path for the Max. node. (5 Marks)



19. (a) Differentiate between Supervised Learning and Unsupervised Learning. Also, give examples of each. (5 Marks)
 (b) What is a filter bubble and how does it work? Give examples. (5 Marks)

20. Explain the Informed and Uninformed search techniques. Also, write down the differences between them. (10 Marks)

21. (a) Explain in detail about Perceptron and its types? (5 Marks)
 (b) What is Convolutional Neural Network (CNN)? (5 Marks)

22. Discuss the applications of Artificial Intelligence in Maritime Sector in details. (10 Marks)