Indian Maritime University

(A Central University, Govt of India)

End Semester Examinations – June 2024

Programme Name: B Tech (ME)

Semester: VI

Subject Code: UG11T4601

Subject Name: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Date: 27.05.2024	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

MCQs –All Questions are Compulsory. (10×01 mark = 10 Marks)

1. Which of the following is the branch of Artificial Intelligence?
   a) Machine Learning b) Cyber forensics
   c) Full-Stack Developer d) Network Design

2. In which of the following situations might a blind search be acceptable?
   a) Real-life situation b) Complex game
   c) Small search space d) All of the mentioned

3. Which one of the following terms is not used in the Bayes' Theorem?
   a) Prior b) Unlikelihood
   c) Posterior d) Evidence

4. What kind of algorithm is logistic regression?
   a) Cost function minimization b) Ranking
   c) Regression d) Classification

5. If the odds in favour of an event be 5/7, find the probability of the occurrence of the event?
   a) 5/7 b) 1
   c) 7/12 d) 5/12

6. What kind of neural network is most frequently applied to the image classification?
   a) RNN (Recurrent Neural Network)
   b) CNN (Convolutional Neural Network)
   c) FNN (Feedforward Neural Network)
   d) LSTM (Long Short-Term Memory)

7. Which is true for neural networks?
   a) It has set of nodes and connections
   b) Each node computes it's weighted input
   c) Node could be in excited state or non-excited state
   d) All of the mentioned

8. Which kind of data does Reinforcement Learning (RL) use?
   a) Labelled data b) Unlabelled data
   c) None d) Both

9. Which of the following is not an application of artificial intelligence?
   a) Computer vision
   b) Natural Language Processing
   c) Data base Management System
   d) Digital assistants

10. A certain Professor at the Stanford University coined the word "Artificial Intelligence" in 1956 at a conference held at Dartmouth College. Can you name the Professor?
    a) David Levy b) John McCarthy
    c) Joseph Weizenbaum d) Hans Berliner

Section B

Five Questions of 02 Marks each

11. What are various applications of AI?

12. How will you measure the problem-solving performance?

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 are the advantages of heuristic function?

Section C

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

16. a) Discuss the historical evaluation of Artificial Intelligence.
    b) What is the difference between Weak AI and Strong AI, and which one is more achievable?

    (7 + 3 marks)

17. Briefly discuss the following (give suitable example for each):
    (i) Supervised learning
    (ii) Unsupervised learning

    (10 Marks)

18. a) Define conditional probability and explain Bayes rule in detail.
    b) Explain in details about Logistic Regression in Machine Learning

    (5 + 5 Marks)

19. a) Explain Algorithmic Bias with examples? Is it avoidable?
    b) What is a filter bubble and how does it work? Give an examples.

    (5 + 5 Marks)

20. a) Differentiate Blind Search and Heuristic Search.
    b) Explain the Mini-Max algorithm

    (5 + 5 Marks)

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

    (5 + 5 Marks)

22. How AI is changing the Maritime Industry and What Are the Advantages?

    (10 Marks)