

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

**Sep/Oct'25 SE**

**Programme Name: B Tech (ME)**

**Semester: VI**

**Subject Code: UG11T4601**

**Subject Name: ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING**

---

Date: 17.10.2025

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.

**Section A**

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

1. Which of the following is a component of Artificial Intelligence?
  - a) Learning
  - b) Training
  - c) Designing
  - d) Puzzling
2. Binary Search is
  - a) Exhaustive
  - b) Informative
  - c) None
  - d) both
3. In the context of AI, which of the following is used to represent the likelihood of an event occurring?
  - a) Odds
  - b) Probability
  - c) Bayes' Rule
  - d) Naive Bayes
4. Which of the following is a type of supervised learning?
  - a) Unsupervised learning
  - b) Reinforcement learning
  - c) Linear regression
  - d) All of the above

5. Commonly used activation functions in ANN is?
  - a) ReLU (Rectified Linear Unit)
  - b) Sigmoid
  - c) Tanh (Hyperbolic Tangent)
  - d) All of the above
  
6. What is the primary ethical concern in artificial intelligence?
  - a) Data privacy and security
  - b) Enhancement of human cognitive ability
  - c) Cost of implementation of AI system
  - d) Speed of algorithm processing
  
7. Which of the following describes an artificial intelligence application?
  - a) It assists in documentation of the company
  - b) It facilitates autonomous route optimization and self-navigating
  - c) It makes website creation simple
  - d) It helps to deploy applications on the cloud
  
8. Which of the following is the branch of Artificial Intelligence?
  - a) Machine Learning
  - b) Computer vision
  - c) Deep Learning
  - d) All of the above
  
9. The search strategy that uses a problem specific knowledge is known as
  - a) Informed Search
  - b) Best First Search
  - c) Heuristic Search
  - d) All of the above
  
10. What is the function of the input layer in an ANN?
  - a) It receives input data and passes it to the hidden layers
  - b) It performs mathematical computations on the input data
  - c) It stores the trained weights and biases of the network
  - d) None of the above

### **Section B**

Five Questions of 02 Marks each

11. Name the components of Human Intelligence
12. What is Search Space? Give example.
13. Briefly explain the difference between "odds" and "probability."
14. Briefly explain why linear regression is used for in machine learning.

15. List few application of artificial neural network.

### Section C

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

16. a) Write a short note with some example on any two 1) Narrow AI 2) Reinforcement (Rewards) Learning 3) Strong AI [5]  
b) What is data Science? Briefly describe various field of data science. [5]
17. a) Describe a search problem along with suitable example supported by state transition diagram. [5]  
b) State & explain Informative Searching Technique with suitable example. [5]
18. a) State Bayes' Rule and explain its key components. [5]  
b) A student can either Pass or Fail an exam based on whether they Study or Not Study. From past records:

#### **Study Result**

Yes	Pass
Yes	Pass
Yes	Fail
No	Fail
No	Fail

Now, given a student has studied, predict whether they will Pass or Fail using Naive Bayes. [5]

19. a) What is the primary difference between supervised and unsupervised learning? Explain with suitable examples. [5]  
b) Explain the working of a nearest neighbour classifier with an example. [5]
20. a) Define activation function. Explain any one types of activation functions. [6]  
b) Differentiate Shallow Neural Network and Deep Neural Network. [4]
21. a) Write a short note on Filter bubble, Algorithmic bias [5]  
b) Discuss briefly how AI is affecting employment. In your view how to mitigate the social issues associated with job loss due to AI and automation. [5]

22. Write a brief essay discussing the use of AI in the shipping, focusing on any two of the following topics: [10]

- Anticipatory maintenance
- Autonomous navigation
- Supply chain management

