

CBCS SCHEME

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22SCS/SCN22

Second Semester M.Tech. Degree Examination, June/July 2023 Artificial Intelligence and Machine Learning

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	What is AI? Explain the fields where foundations of AI is used. Mention some applications of AI.	10	L2	CO1
	b.	You are provided with two water jugs, one with 5 gallons of capacity and the other with 3 gallons of capacity. Neither have any measuring marks on it. How can we get exactly 4 gallons of water in 5 gallon jug? i) Write down the production rules for the above problem. ii) Find any one solution for the above problem.	10	L2	CO1
OR					
Q.2	a.	Write Breadth first search algorithm and explain by taking suitable example.	10	L2	CO1
	b.	Explain the process of simple hill climbing with algorithm and also explain the problems with hill climbing.	10	L2	CO1
Module – 2					
Q.3	a.	Explain MINIMAX procedure, strategy and algorithm.	12	L2	CO1
	b.	Show that $\alpha : (A \wedge B) \vee (A \wedge \sim B) \vee (\sim A \wedge B)$ is unsatisfiable using the tableau method.	8	L2	CO1
OR					
Q.4	a.	Write down the steps to transform a formula to its equivalent CNF. Convert the formula $(\sim A \rightarrow B) \wedge (C \wedge \sim A)$ into its equivalent CNF representation.	10	L2, L3	CO1
	b.	Explain the game playing problem with an example game tree, where MAX is playing first.	10	L2, L3	CO2
Module – 3					
Q.5	a.	What is Means Ends analysis? Write the algorithm and explain by taking suitable example.	10	L2	CO2
	b.	Explain semantic net method of knowledge representation with an example.	10	L2	CO2

OR

Q.6	a.	Discuss about knowledge representation with frames. Give the structure and faults in a frame.	10	L3	CO2
	b.	Demonstrate forward reasoning and backward reasoning inference mechanism for the following set of classes: isa (X, human ← is a (X, man) isa (John, man).	10	L3	CO2

Module – 4

Q.7	a.	Explain the concept of Bayes theorem and derive Bayes theorem from conditional probability.	10	L2	CO2
	b.	We are given probability of any person chosen at random bring literate as 0.40 and probability of any person chosen at random having age > 60 years as 0.005. Find the probability of the fact that a person chosen at random of age > 60 years is literate.	10	L2	CO2

OR

Q.8	a.	Discuss about K Means and hierarchical clustering techniques in brief.	10	L2	CO2
	b.	Explain the components of a learning system with a neat sketch.	10	L2	CO2

Module – 5

Q.9	a.	What is SVM? Outline the working of SVM (Support Vector Machine) for linear and non linear classification.	10	L2	CO3
	b.	Discuss the different issues while designing an ANN (Artificial Neural Network).	10	L3	CO3

OR

Q.10	a.	What is an ANN? Explain a neuron model with relevant expressions.	10	L2	CO3
	b.	Design a perceptron for Boolean or function using learning algorithm. Assume $W_1 = -0.2$, $W_2 = 0.4$ and Learning rate $A = 0.2$.	10	L2	CO3
