Enroll. No._____

MARWADI UNIVERSITY
MU-FOT
CE-FOT1 (MU)
Semester 7 - Summer

Subject : ARTIFICIAL INTELLIGENCE (01CE0702)
Date : 13-May-2022 **Time : 3 Hours** **Total Marks : 100**

Instructions :

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Que.1 (A) Answer the following objectives **[10]**

(1) A* algorithm is based on
A) Breadth-First-Search B) Depth-First –Search C) Best-First-Search D) Hill climbing

(2) Which of the following language is a declarative language?
A) C# B) COBOL C) Prolog D) JAVA

(3) Which of the following areas can contribute to build an intelligent system?
A) Philosophy B) Biology C) Sociology D) All of the above

(4) KB stands for
A) Known basis B) Knowledge base C) knight bisup D) None of them

(5) What is meant by probability density function?
A) Probability distributions B) Continuous variable C) Discrete variable D) Probability distributions for Continuous variables

(6) which one is/are element of probability theory.
A) event B) sample set C) sample space D) all

(7) Statement 1: 8 Queens problem can be formulated in two ways:
Statement 2: N Queens problem can be formulated in two ways:
A. 1 is true
B. 2 is True
C. None is true
D. 1 and 2 both are true

(8) Which of the following propersties of Knowledge is not less desirable
A) Voluminuous B) Constantly Changing C) Different from Usable Data D) Easily characterizable

(9) Fuzzy logic is extension of Crisp set with an extension of handling the concept of Partial Truth.
A) FALSE B) None C) TRUE D) no conclusion from statement.

(10) Which of the following is not a part of fuzzy logic Systems Architecture
A) Fuzzification Module B) Knowledge Base C) Defuzzification Module D) inference base

Que.1 (B) Answer the following questions. **[10]**

(1) Write the problems with Hill Climbing method. Local Maxima, Ridges and Plateaus

(2) What is problem-solving approach, explain in one line Process of generating soln. from observed data (set of goals, objects & oprn.)

(3) What is heuristic? Type of search which uses prior info (Informed Search)

(4) What is to be done to void problem local maxima in Hill climbing Steepest Ascent HC
Simulated Annealing

(5) what is a fuzzy logic? an approach to computing based on "degrees of truth" rather than the usual "true or false

(6) In prolog Facts describe ? Relation between objects

(7) Foundations of AI were laid in which area ? Computer Science, Biology, Psychology, Linguistics, Mathematics, and Engineering.

(8) What is reinforcement Learning. a machine learning technique that teaches machines how to maximize rewards by taking actions in an environment.

(9) Out of 200 emails, a classification model correctly predicted 150 spam emails and 30 ham emails. What is the error rate of the model? Error Rate= (False Positives + False Negatives)/Total Predictions

(10) AO* stands for ? Adaptive Operator, Anytime Optimistic, AND-OR

Que.2

(A) Draw analogy of ANN with biological neuron [8]

(B) Explain Bayes theorem. [8]

OR

(B) Explain Recursion and Iteration in Prolog with example. [8]

Que.3

(A) What is inference system? Expain any one approach used by inference system to draw conclusion/output. [8]

(B) Write and explain prolog program to find maximum number in list. [4]

(C) What are performance measures in machine learning and when they are used? [4]

OR

(A) Discuss LISP and its Properties [8]

(B) Eplain how Tic-Tac-Toe game can be solved using Minimax algorithm. [4]

(C) Apply A* algorithm to any example and explain the steps included [4]

Que.4

(A) Explain list in Prolog with example. [8]

(B) Write and explain Prolog program to print N natural numbers using concept of recursion [8]

OR

(A) Explain clustering using KNN with example. [8]

(B) Explain minimax algorithm in detail. [8]

Que.5

(A) Explain Comparison operators in Prolog with example. [6]

(B) Explain Simple Hill-Climbing with example in detail. [6]

(C) Explain the forward and backward Reasoning. [4]

OR

(A) explain baysian belief network. [6]

(B) Explain the Level of the Model with respect to AI [6]

(C) Explain branch and bound by taking any example [4]

Que.6

(A) Write down advantages and disadvantages of fuzzy logic/system. [8]

(B) Discuss different task domain of AI. [4]

(C) why fuzzy logic used for representation of uncertainty. [4]

OR

(A) Explain reinforcement learning in detail. [8]

(B) Explain Closed List Pruning. [4]

(C) Define in your own works the following terms: agent, rationality, percepts, environment, actuator [4]

---Best of Luck---

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Difficulty Level	Weightage Recommended	Actual	No of Question	Total Marks	Question List
High	20	13.37	5	23	1(B), 3(A), 5(B), 6(C)
Low	20	25.58	14	44	1(A), 1(B), 3(B), 4(A), 4(B), 5(A), 5(C)
Medium	60	61.05	26	105	1(A), 1(B), 2(A), 2(B), 3(A), 3(B), 3(C), 4(A), 4(B), 5(B), 5(C), 6(A), 6(B)

Module Name	Weightage Recommended	Actual	No of Question	Total Marks	Question List
Introduction	5	7.56	5	13	1(A), 1(B), 5(B), 6(B)
Heuristic search	18	8.72	7	15	1(A), 1(B), 5(B), 6(C)
Finding Optimal Path	10	10.47	6	18	1(A), 1(B), 3(C), 5(C), 6(B)
Structured Knowledge representation	10	5.23	2	9	1(A), 3(A)
Game Playing	7	12.21	4	21	1(B), 3(B), 4(B), 6(A)
Machine Learning	7	12.21	4	21	1(B), 2(A), 3(C), 4(A)
Statistical Reasoning	18	18.02	9	31	1(A), 1(B), 2(B), 5(A), 6(A), 6(C)
Introduction to Prologs	25	25.58	8	44	1(A), 1(B), 2(B), 3(A), 3(B), 4(A), 4(B), 5(A)

Blooms Taxonomy	Weightage Recommended	Actual	No of Question	Total Marks	Question List
Remember / Knowledge	10	5.23	6	9	1(A), 1(B), 5(C)
Understand	20	58.14	23	100	1(A), 1(B), 2(A), 2(B), 3(A), 3(B), 3(C), 4(A), 5(A), 5(B), 5(C), 6(A), 6(B), 6(C)
Apply	25	16.86	9	29	1(A), 1(B), 3(C), 4(A), 4(B), 6(B)
Analyze	25	16.28	4	28	2(B), 3(B), 4(B), 6(A)
Evaluate	10	3.49	3	6	1(B), 6(C)
Higher order Thinking	10	0.00	0	0