Enroll. No._____

MARWADI UNIVERSITY
MU-FOT
CE-AI
Semester 5 - Summer

Subject : ARTIFICIAL INTELLIGENCE (01AI0502)
Date : 11-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 Answer the following objectives **[10]**
(A)

(1) Not true about A* search:

A. Optimally efficient
B. Complete
C. Number of nodes searched still exponential in the worst case
D. Uses only heuristic values.

(2) Definition of Artificial Intelligence can be:
1) The ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

2) A branch of computer science concerned with building smart machines capable of performing tasks that typically require human intelligence.

A) 1 or 2
B) 1 and 2
C) 1
D) 2

(3) (2+3 = 5) conjunction (7>=8) disjunction (6>5.999)

A. TRUE
B. FALSE
C. None
D. not saficient data to derive conclusion

(4) Freddy robot was bult to do:

A. Assembly of the objects
B. Medical diagnosis
C. Autonomous driving
D. Gaming

(5) General algorithm applied on game tree for making decision of win/lose is

A. BFS/DFS
B. Informed search
C. MinMax
D. Greedy search

(6) Time and Memory in Breadth first search (BFS):

A. Increase when Depth and Nodes increase.
B. Decrease when Depth and Nodes increase.
C. Decrease when Depth and Nodes decrease.
D. Increase when Depth and Nodes decrease.

(7) __ not a performance measure for a search algorithm.

A) Robust
B) Space complexity
C) Time
D) Optimality

(8) Which of the following language is a declarative language?

(A) C#
(B) Algol
(C) Prolog
(D) Java

(9) Which one from the options would return true/yes for given prolog program?
boy(john,123).
girl(jane,234).
student(john,123).

A. ?- girl(jane,x).
B. ?- boy('john',123).
C. All of above.
D. None of above

(10) __ is component of KBA.

A. KB
B. MP
C. UP
D. CP

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

(1) To write goal in prolog which format is used ? ?- <predicate> (<term1>, <term2>, ..., <termN>)

(2) Write down components of KBA? KB and Inference Engine

(3) List out the sections in prolog programming.

(4) Collection of knowledge in prolog is called ____. KB

(5) In prolog Facts describe _____. facts describe relationships between entities.

(6) How we can take input from user while program is processing ?

(7) Data types in prolog programming are : ? Atoms, numbers, compound terms, variables, lists

(8) Rules for valid object name in prolog are (any two) ? start with lower, _ + contain (alpha-num, _, -)

(9) Recursion is mostly used with what concept of prolog ?

(10) Full form of LISP is List Processing.

Que.2

(A) Write the following sentences in FOL: (i) All birds fly, (ii) Every man respects his parent, (ii) Some boys play cricket, (iv) Not all students like both Mathematics and Science. [8]

(B) How many types of agents exist? Explain with their diagram and examples (do not include the ones if asked in the question paper) [8]

OR

(B) Draw and elaborate tic-tac-toe game tree. [8]

Que.3

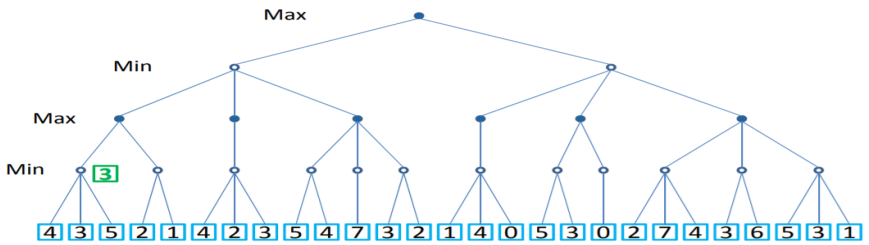
(A) Describe types of game playing with examples. [8]

(B) Apply AO* algorithm to any example and explain the steps included. [4]

(C) Write a program to delete an element from the list. [4]

OR

(A) Apply the minimax algorithm in the below game-tree. [8]



(B) Explain following terms with reference to Prolog programming language: Clauses, Predicates, Domains, Goal. [4]

(C) Write a prolog program for finding maximum number from a list. [4]

Que.4

(A) What is LISP ? How it is used to create programs in the field of AI. [8]

(B) Hill climbing guaranteed to find a solution for n-queens problem, explain? [8]

OR

(A) Explain with examples AND-OR Graphs. [8]

(B) Critically explain Arogya Setu and characterize the environment according to their properties. [8]

Que.5

(A) Explain KBA with architecture. [6]

(B) Describe Depth first search with graphic and pseudocode. [6]

(C) Explain components of Inference Engine. [4]

OR

(A) Show usage of AO* algorithm to solve N-Queen problem. [6]

(B) Suppose that we run a greedy search algorithm with $h(n) = —g(n)$. What sort of search will the greedy search emulate? [6]

(C) Expain sematic networks. [4]

Que.6

(A) Compare the search algorithms like breadth first search and depth first search. Explain with necessary graphics and equations. [8]

(B) Write a prolog program to get sum of all the numbers from a list. [4]

(C) What is AI? Define properties of AI problem. [4]

OR

(A) Describe Hill climbing method with all steps and pseudo code. Use necessary graphics to explain this. [8]

(B) Explain repeat predicate with example. [4]

(C) Write a prolog program for permutation problem. [4]

---Best of Luck---

MARWADI UNIVERSITY
MU-FOT
CE-AI
Semester 5 - Summer

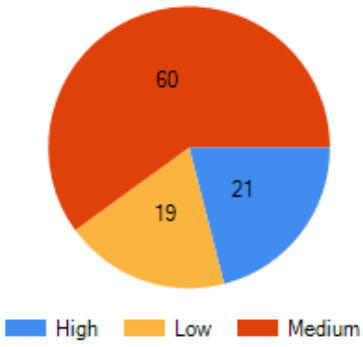
Subject : ARTIFICIAL INTELLIGENCE (01AI0502)

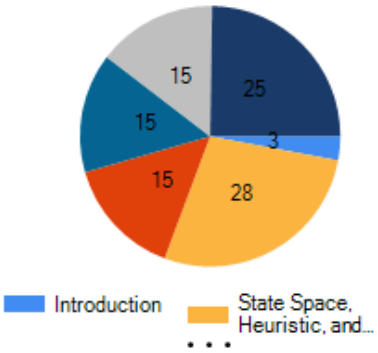
Date : 11-May-2022 **Time : 3 Hours** **Total Marks : 100**

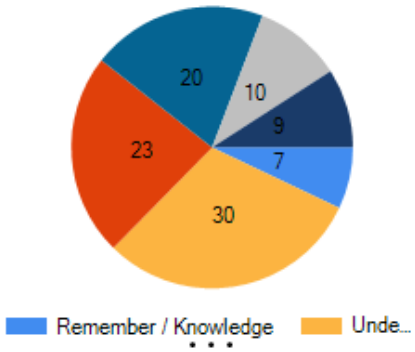
Difficulty Level	Weightage Recommended	Weightage Actual	No of Question	Total Marks	Question List
High	20	20.93	11	36	1(A), 3(C), 4(B), 5(B), 6(A), 6(C)
Low	20	19.19	8	33	1(A), 1(B), 3(A), 4(A), 5(A), 5(C), 6(C)
Medium	60	59.88	26	103	1(A), 1(B), 2(A), 2(B), 3(A), 3(B), 3(C), 4(A), 4(B), 5(A), 5(B), 5(C), 6(A), 6(B)

Module Name	Weightage Recommended	Weightage Actual	No of Question	Total Marks	Question List
Introduction	4	3.49	3	6	1(A), 6(C)
State Space, Heuristic, and Random Search	28	27.91	8	48	1(A), 2(B), 4(B), 5(B), 6(A)
Finding Optimal Path	15	14.53	5	25	1(A), 3(B), 4(A), 5(A), 5(B)
Game Playing	15	14.53	4	25	1(A), 2(B), 3(A)
Knowledge based reasoning, Logic and Inferences	15	14.53	7	25	1(A), 1(B), 2(A), 5(A), 5(C)
Introduction to Prologs	23	25.00	18	43	1(A), 1(B), 3(B), 3(C), 4(A), 6(B), 6(C)

Blooms Taxonomy	Weightage Recommended	Weightage Actual	No of Question	Total Marks	Question List
Remember / Knowledge	10	6.98	9	12	1(A), 1(B), 3(B)
Understand	20	30.23	14	52	1(A), 1(B), 3(A), 4(A), 5(A), 5(C), 6(A), 6(B), 6(C)
Apply	25	23.26	9	40	1(A), 2(A), 3(A), 3(C), 5(A), 6(B), 6(C)
Analyze	25	20.35	8	35	1(A), 2(B), 3(B), 4(A), 5(B)
Evaluate	10	9.88	3	17	1(A), 2(B), 6(A)
Higher order Thinking	10	9.30	2	16	4(B)


60
21
19
High
Low
Medium


15
25
15
3
15
28
Introduction
State Space, Heuristic, and...


20
10
9
23
7
30
Remember / Knowledge
Unde...