Candidate seat No: _____

Charotar University of Science and Technology
Devang Patel Institute of Advance Technology and Research
Department of Information Technology
Subject: IT473 Artificial Intelligence
University Exam – Dec 2021

Semester: 7th (B. Tech.) **Maximum Marks: 70**
Date: 01/12/2021, Wednesday **Time: 01:30 pm to 04:30 pm**

Instructions:
(i) Attempt ***all*** the MCQ questions.
(ii) Attempt ***any 10 of*** the Descriptive questions
(iii) Figures to the right indicate ***full*** marks.
(iv) Make suitable assumptions and draw neat figures wherever required.

Section : 1

Sr. No	Questions	Marks	CO	BL
1	_____ is the goal of AI. a) To solve artificial problems b) To extract scientific causes c) To explain various sorts of intelligence d) To solve real-world problems	1	1	R
2	Consider following sentences regarding A *, an informed search strategy in Artificial Intelligence (AI). (a) A * expands all nodes with f (n) < C *. (b) A * expands no nodes with f (n) ≥ C *. (c) Pruning is integral to A *. Here, C * is the cost of the optimal solution path. Which of the following is correct with respect to the above statements? A. Both statement (a) and statement (b) are true. B. Both statement (a) and statement (c) are true. C. Both statement (b) and statement (c) are true. D. All the statements (a), (b) and (c) are true.	2	2	A

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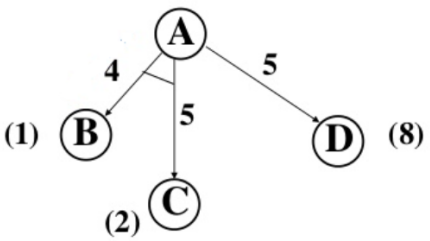
3	Consider the following bachelor Prolog program. What would it be the "INCORRECT" result of the following query? bachelor(P) :- male(P), not married(P). male(henry). male(tom). married (tom). A. ?- bachelor (henry). yes B. ?- bachelor (tom). No C. ?- bachelor (Who). Who=henry D. ?- married(X). X=tom E. ?- male (P). no	**1**	**3**	**A**
4	Consider the following statement: "The search first begins from the root node and the first one of the child node's sub-tree is completely traversed. That is, first all the one-sided nodes are checked, and then the other sided nodes are checked." Which search algorithm is described in the above definition? A. The Breadth First Search (BFS) B. The Depth First Search (DFS) C. The A* search D. None of the above	**1**	**2**	**U**
5	Consider the following statement, "After all the gathering of knowledge and planning the strategies, the knowledge should be applied and the plans should be executed systematically to reach the goal state most efficiently and fruitfully." What does the above definition refer to? A. Knowledge gathering strategy B. Final step of solving the AI problem, which is applying the strategies C. State space deciding D. None of the above	**1**	**4**	**U**
6	Consider the following AO graph: Which is the best node to expand next by AO* algorithm? Consider the Edge cost given in the figure and perform calculations accordingly. The values with brackets "()" are heuristic values. 	**2**	**2**	**A**

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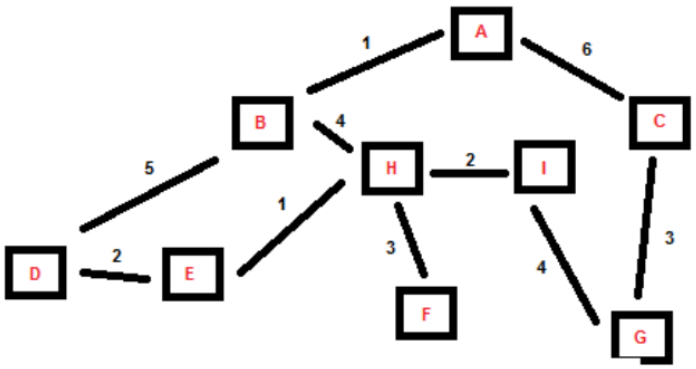
7	Find the path from D to G using Best First Search Algorithm 	**2**	**2**	**A**
8	What is the objective of backpropagation algorithm? a) to develop learning algorithm for multilayer feedforward neural network b) to develop learning algorithm for single layer feedforward neural network c) to develop learning algorithm for multilayer feedforward neural network, so that network can be trained to capture the mapping implicitly d) none of the mentioned	**1**	**5**	**R**
9	Which of the following is not the promise of artificial neural network? a) It can explain result b) It can survive the failure of some nodes c) It has inherent parallelism d) It can handle noise	**1**	**5**	**U**
10	Consider a single perceptron with a sign activation function. The perceptron is represented by weight vector [0.4 - 0.3 0.1]t and a bias Θ = 0. If the input vector to the perceptron is X = [0.2 0.6 0.5] then the output of the perceptron is : (a)1 (b)0 (c)-0.05 (d)-1	**2**	**5**	**A**
11	Choose from the following areas where NLP can be useful. a) Automatic Text Summarization b) Automatic Question-Answering Systems c) Information Retrieval d) All of the mentioned	**1**	**4**	**U**
12	Many words have more than one meaning; we have to select the meaning, which makes the most sense in context. This can be resolved by (a) Fuzzy Logic (b) Word Sense Disambiguation	**1**	**4**	**U**

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	(c) Shallow Semantic Analysis (d) All of the mentioned			
13	Where does the bayes rule can be used? a) Solving queries b) Increasing complexity c) Decreasing complexity d) Answering probabilistic query	**1**	**4**	**R**
14	There exists two way to infer using semantic networks in which knowledge is represented as Frames. 1) Intersection Search 2) Inheritance Search (a) True (b) False	**1**	**3**	**U**
15	An algorithm A is admissible if _____ a) It is not guaranteed to return an optimal solution when one exists b) It is guaranteed to return an optimal solution when one exists c) It returns more solutions, but not an optimal one d) It guarantees to return more optimal solutions	**1**	**2**	**U**
16	Consider a problem of preparing a schedule for a class of student. This problem is a type of a) Search Problem b) Backtrack Problem c) CSP d) Planning Problem	**1**	**1**	**U**
	Section :2			
17	Explain Depth-first search and Breadth-first search with example	5	1	R
18	Discuss the hill-climbing search method. Also, discuss limitations and ways to overcome these limitations	5	2	U
19	Solve following crypt arithmetic problem with appropriate strategy/steps: E A T + T H A T A P P L E	5	2	A

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20	Describe different heuristics for the following types of problems: i. Blocks world ii. Tic Tac Toe	5	2	A
21	Assume the following facts : • Steve only likes easy courses. • Science courses are hard. • All the courses in the basketweaving department are easy. • BK301 is a basketweaving course. Use Resolution to answer the question, "What Course would Steve like?	5	3	A
22	Explain the vanishing gradient problem using suitable examples	5	4	R
23	Explain Sequential Pattern Recognition problem using Hidden Markov Model	5	5	U
24	Differentiate Monotonic and Non monotonic reasoning.	5	3	U
25	Explain syntax and semantic analysis of natural language processing in detail.	5	4	U
26	State Property Inheritance Algorithm and explain it with the help of Example	5	3	R
27	Define Semantic Net. Represent the following sentence using semantic net: `Sita gave the pearl garland to Hanuman.'	5	3	A
28	Describe the Expert System Development Procedure.	5	5	R
29	Compare Fuzzy Vs Crisp logic and their membership function.	5	4	U
30	State five different applications of Computer Vision.	5	5	A

Note:
CO – Course Outcomes
BL – Bloom's Taxonomy Level

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