

Maharashtra Institute of Technology, Aurangabad

(An Autonomous Institute)

END SEMESTER EXAMINATION

Second Year B.Tech (AI & DS) Feb/Mar-2023

Course Code: AID202

Course Name: Introduction to Artificial Intelligence

Duration: 2 Hrs

Max. Marks: 50

Date:

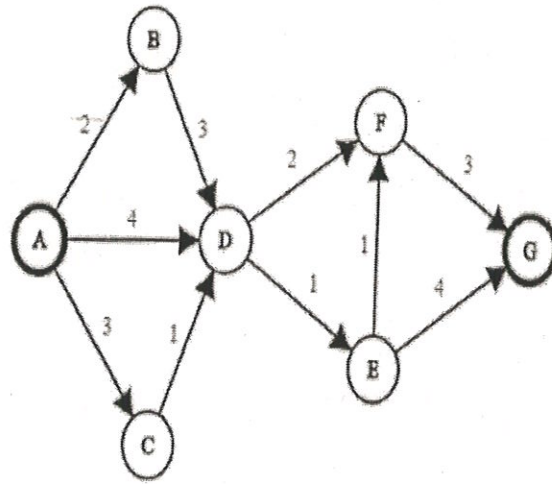
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Instructions:

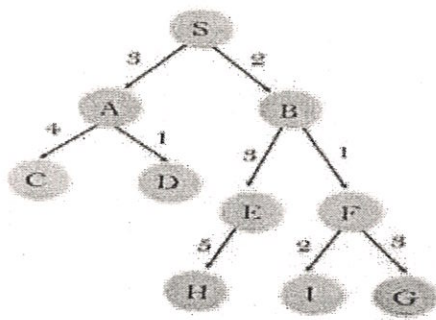
- All questions are compulsory
- Assume suitable data wherever necessary and clearly state it
- Figures to right indicate full marks

Note:- All course outcomes shall be addressed.

Q.	Answer any five (Marks:10)	Marks	CO	BL	PI
1					
a)	What is AI? Explain how an AI system is different from a conventional computing system	2	1	2	1.3.1
b)	What is Inductive learning?	2	2	2	2.2.3
c)	Differentiate between branch and bound technique and backtracking	2	3	2	2.2.3
d)	Explain formulation of problem in game playing	2	4	3	2.2.3
e)	Define local consistency and its type.	2	5	1	2.2.3
f)	How will you measure the problem-solving performance?	2	6	2	2.2.3
g)	Differentiate between supervised and unsupervised learning	2	2	3	2.2.3
h)	What is Reinforcement learning? Explain in brief.?	2	2	1	2.2.3
Q.2	Solve any one following questions				
a)	What are Agent and Environment? Explain properties of agent	8	1	2	1.3.1
b)	Draw and explain architecture of utility-based agent and illustrate this with real life example GPS.	8	1	3	1.3.1
Q3	Solve any one following questions				
a)	Explain A* admissible & consistency. Consider the following directed graph, having A as the starting node and G as the goal node, with edge costs as mentioned, and the heuristic values for the nodes are given as - {h(A)=7, h(B)=6, h(C)=5, h(D)=4, h(E)=3, h(F)=3, h(G)=0}. Determine h(n) will satisfy admissibility and consistency property.	8	3	3	2.2.3



b) Explain Best first Search algorithm. Consider the following graph to find optimal path using best first search algorithm from start node S to goal node G. Draw stepwise tree search space for every visited node and write path



node	H (n)
A	12
B	4
C	7
D	3
E	8
F	2
H	4
I	9
S	13
G	0

8 3 3 2.2.3

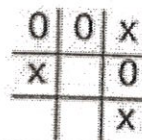
Q.4 Solve any one following questions

a) Explain alpha beta pruning. Apply alpha -beta pruning with minimax search tree on following data 91 21 39 101 61 69 71 71 89 11 29 49 59 51 81 and 79. Also compare complexities of minimax with alpha beta pruning algorithms.

8 4 3 2.2.3

b) Explain the concept of game tree. Consider the game of 3 X 3 Tic-Tac-Toe where Max plays (cross) X and Min plays (naught) O. If the Max player wins then the final score is +1. If the Min player wins then the final score is -1 and 0 for a draw. Assume that the game has reached the position shown below where max and min player plays thrice. Show the optimal path in a game tree search space using backing-up values.


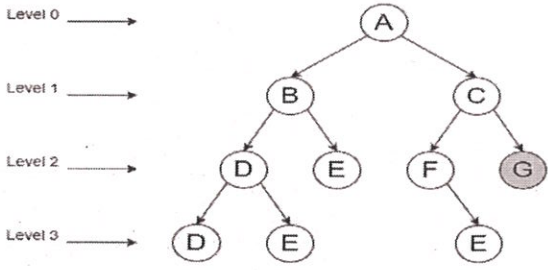
8 4 3 2.2.3



Q.5 Solve any two following questions

a) Write backtracking search algorithm for CSPs. Explain the failure stages of this algorithm with map coloring.

4 5 3 2.2.3

b)	<p>What is cryptarithmic problem? Illustrate use of CSP with following example with complete solution</p> $ \begin{array}{r} \text{SEND} \\ + \text{MORE} \\ \hline \text{MONEY} \end{array} $	4	5	3	2.2.3
c)	<p>Explain how the minimum remaining value and least constraining value are used to paint proper color of the following map</p> 	4	5	2	2.2.3
Q.6 Solve any two following questions					
a)	<p>How artificial intelligence will change the future (Retail/Healthcare, etc)</p>	4	2	2	2.2.3
b)	<p>Apply the depth-first iteratively deepening search on the following tree. For the same, determine the space and worst-case time complexity.</p> 	4	6	3	2.2.3
c)	<p>Explain Steepest-Ascent hill-climbing algorithm. What are various problem in hill climbing algorithm</p>	4	6	3	2.2.3

