

9th semester IMCA Examination – 2019

Intelligent System (9.4)

Full Marks – 70

Time – 3 Hours

(Answer All Questions)

1	a	Explain the components and function of a problem solving agent.	[5]																	
)	What is an uninformed search? Explain the Breadth First Search Algorithm. Compare the performances of different uninformed search techniques.	[6]																	
	b	Find the number of nodes generated in BFS and Iterative Deepening Search when the branching factor is 3 and the depth of shallowest goal node is 5.	[3]																	
)	<p>OR</p> <p>Explain the A* Search algorithm for searching solutions. Solve the following 8-puzzle problem using A* search algorithm.</p> <table style="margin-left: auto; margin-right: auto;"> <tr> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">3</td> <td style="border: 1px solid black; padding: 2px;">1</td> <td style="border: 1px solid black; padding: 2px;">2</td> <td style="border: 1px solid black; padding: 2px;">3</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">6</td> <td style="border: 1px solid black; padding: 2px;">4</td> <td style="border: 1px solid black; padding: 2px;"></td> <td style="border: 1px solid black; padding: 2px;">8</td> <td style="border: 1px solid black; padding: 2px;"></td> <td style="border: 1px solid black; padding: 2px;">4</td> </tr> <tr> <td style="border: 1px solid black; padding: 2px;">8</td> <td style="border: 1px solid black; padding: 2px;">7</td> <td style="border: 1px solid black; padding: 2px;">5</td> <td style="border: 1px solid black; padding: 2px;">7</td> <td style="border: 1px solid black; padding: 2px;">6</td> <td style="border: 1px solid black; padding: 2px;">5</td> </tr> </table> <p>(Initial state) (Goal State)</p>	1	2	3	1	2	3	6	4		8		4	8	7	5	7	6	5
1	2	3	1	2	3															
6	4		8		4															
8	7	5	7	6	5															
d	Describe briefly about Depth Limited search.	[4]																		

	e)		
2	a)	Discuss the Min-max algorithm with a suitable example.	[10]
	b)	What is the effectiveness of Alpha-beta pruning procedure?	[4]
		OR	
	c)	Write short notes on the followings.	[14]
		i) Game Tree ii) MiniMax decision iii) Alpha-beta pruning iv) 4-Queen Problem	
3	a)	Explain the components and inference rules in Propositional Logic.	[7]
	b)	Give the structure of the Wumpus world problem. Consider the following Knowledge Base.	[7]

)	<p>"The square has a stench if and only if its adjacent squares contain Wumpus. There is no stench in square [1, 1]".</p> <p>Using resolution algorithm of propositional logic, prove that there is no Wumpus in the square [2, 1] and also in [1, 2].</p> <p style="text-align: center;">OR</p> <p>Write the following sentences in FOL.</p> i) John's father is the grandfather of his son. ii) All the MCA students passed in all the subjects of 4 th semester exam.	[4]
	c)	What is unification? Unify the given two sentences:	[2]
	d)	Lives(x, America), Lives (John, y)	[5]
	e)	Explain the function of a knowledge based agent.	[3]
	f)	Write the inference rules of first order logic.	
4	a)	Write the differences between planning agent and problem solving agent. Explain the structure and function of a simple planning agent.	[7]
	b)	What is Partial order planning? Explain the components of a partial order plan with a suitable example.	[7]
		OR	
	c)	Describe the basic mechanism of a conditional planning agent with a suitable	[7]

SUB Code [2]

PTO...

SUB Code [1]

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	example.	[7]
d)	What is action schema? Explain the representation of planning problem with reference to Air cargo Transport problem.	
5	Describe the followings. i) Biological structure of a neuron ii) Perceptron iii) Activation function OR	[14]
a)	Discuss the structure and components of a learning agent.	[7]
b)	Explain the decision tree learning method in a classification problem.	[7]