Daffodil International University

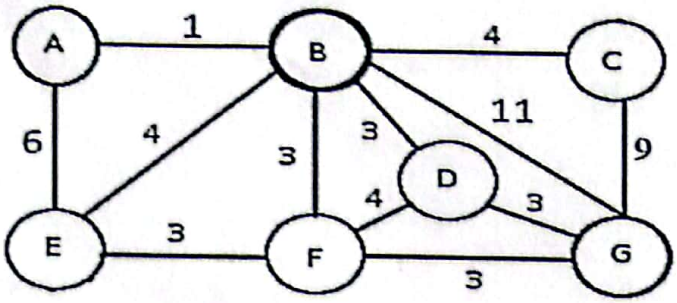
Department of Computer Science and Engineering
Faculty of Science & Information Technology
Final Examination, Fall-2023
Course Code: CSE315, Course Title: Artificial Intelligence
Level: L3 Term: T1/2 Batch: 60

Time: 2 Hours **Marks: 40**

Answer ALL Questions [Optional]

[The figures in the right margin indicate the full marks and corresponding course outcomes. All portions of each question must be answered sequentially.]

1. a) Consider the following scenario:



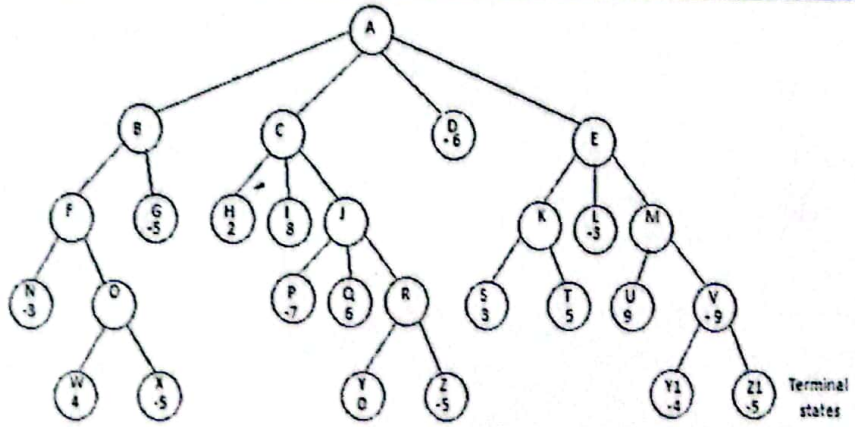
Straight line distance from G

A	6
B	4
C	5
D	5
E	2
F	6
G	0

Now, perform the following search algorithms on the above scenario, where the start node is A and the goal node is G. Please note that you should not re-visit the states visited previously. A* search

CO2

		i)	Greedy best-first search.	5
		ii)	A* Search.	5
	b)	i)	Consider any two-player, turn-taking, board game. Represent this game as a search problem	5
		ii)	Consider the following game tree.	5



board evaluation from computer's perspective

Now, perform the minimax search on the above game tree.

	c)		Given, $KB = \neg Q \rightarrow \neg P, \neg R \rightarrow \neg Q, \neg P \rightarrow \neg R.$ $\alpha = P \rightarrow Q \wedge Q \rightarrow P \wedge P \rightarrow R.$ Find out whether KB $\models \alpha$.	5	
	d)		A doctor is called to see a sick child. The doctor has prior information that 90% of sick children in that neighborhood have the flu, while the other 10% are sick with measles. Let F stand for an event of a child being sick with flu and M stand for an event of a child being sick with measles. Assume for simplicity that $F \cup M = \Omega$, i.e., that there no other maladies in that neighborhood. A well-known symptom of measles is a rash (the event of having which we denote R). Assume that the probability of having a rash if one has measles is $P(R \mid M) = 0.95$. However, occasionally children with flu also develop rash, and the probability of having a rash if one has flu is $P(R \mid F) = 0.08$. Upon examining the child, the doctor finds a rash. What is the probability that the child has measles?	5	
	e)		Derive fitness function for 9 queen problem and find the fitness of following chess board: P1 = (1,2,3,4,5,6,7,8,9) P2 = (1,5,8,4,5,9,2,8,7) P3 = (6,2,9,4,7,6,1,8,5) P4 = (1,2,3,4,6,7,8,9,5)	5	
2.			What are the components of an Expert system? Describe them in brief.	5	CO1