University of Asia Pacific

CSE 403: Artificial Intelligence and Expert Systems (Section: A)

Second Class Test (CT#2)

Spring 2021 Time: 30 minutes Date: 07/09/2021 (Tuesday)

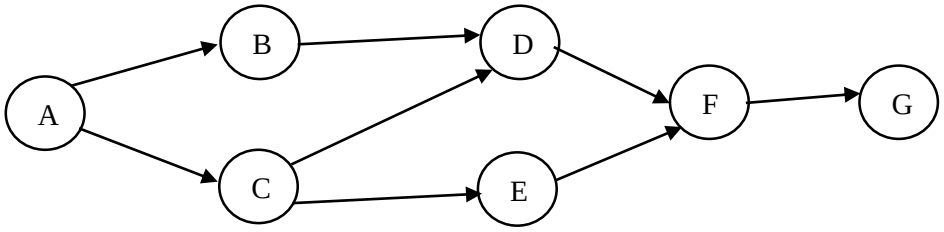
Full Marks: 20

Name: **Reg. #**

Please answer to the question below: **Marks**

The target is to reach the goal node 'G' from the initial node 'A' with the optimal cost. **20**

Please simulate the following search problem with A* search algorithm and show the shortest path with the fringe for each iteration.



Please assume that states with earlier alphabetical order are to be expanded first. There are 7 nodes in the above graph where their heuristic values are given below:

h(A) = (last 2 digits of your reg. no.) % 3 + 3	h(B) = (last 2 digits of your reg. no.) % 4 + 4	h(C) = (last 2 digits of your reg. no.) % 5 + 5	h(D) = (last 2 digits of your reg. no.) % 6 + 6
h(E) = (last 2 digits of your reg. no.) % 3 + 2	h(F) = (last 2 digits of your reg. no.) % 4 + 3	h(G) = 0	

Here % means MOD operation which finds the remainder. For example, if the last 2 digits of the reg. no. is 12, then

h(A) = 12 % 3 + 3 = 0 + 3 = 3	h(B) = 12 % 4 + 4 = 0 + 4 = 4	h(C) = 12 % 5 + 5 = 2 + 5 = 7	h(D) = 12 % 6 + 6 = 0 + 6 = 6
h(E) = 12 % 3 + 2 = 0 + 2 = 2	h(F) = 12 % 4 + 3 = 0 + 3 = 3	h(G) = 0	

There are also 8 edges/paths in the graph, where each path cost is as follows:

A -> B = 3	A -> C = 2	B -> D = 4	C -> D = 1
C -> E = 2	D -> F = 4	E -> F = 4	F -> G = 2