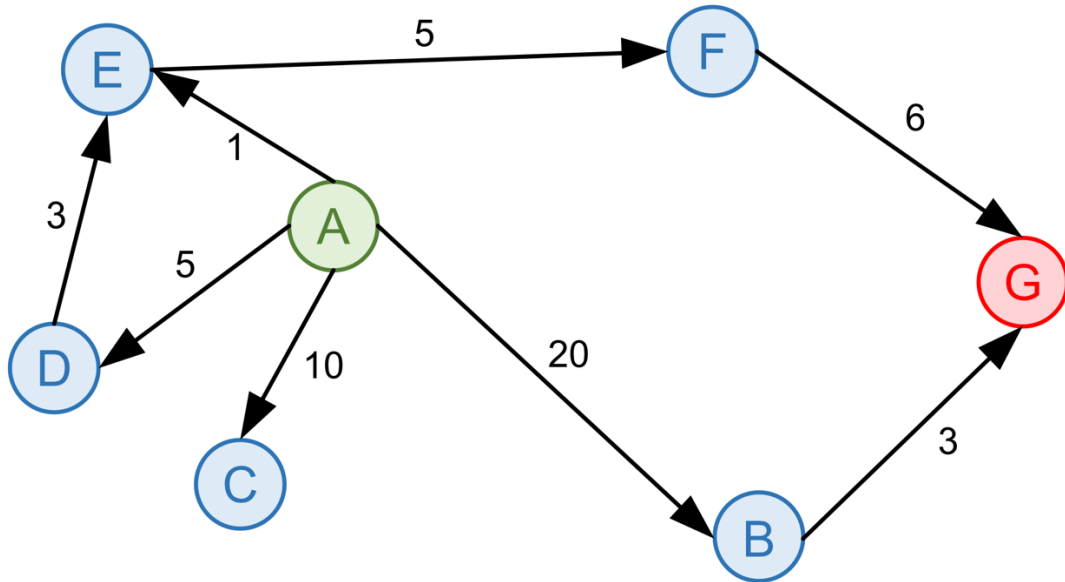# CDS521 Foundation of Artificial Intelligence
Written Assignment 3
(Due: 8th May, 2023)

40 marks

1. You are given the following state space of a problem.

In this diagram, each node represents a state, and each directed edge represents a transition action. For

example, means there is an action from state A to state B and this action has a step

cost of 20. Note that since there is no directed edge starting from state B to state A, there is no action available from transiting from state B to state A. The green state A is the initial state, and the red state G is the goal state.

The estimates cost of travelling from any state to goal state G calculated with the heuristic function shown in the follow table:

Node	Estimated Cost
A	8
B	2
C	3
D	10
E	7
F	4

a. Based on table above, please use **Best-First Search** to (1) find a sequence of actions that can travel from state A to state G, (2) calculate the corresponding path cost, and (3) visualize the final search tree. <u>Your search tree should also include the estimated cost of each node</u>. (20 marks)

b.   Based on table above, Please use **A* Search** to (1) find a sequence of actions that can travel from state A to state G, (2) calculate the corresponding path cost, and (3) visualize the final search tree. Your search tree should also include the **total** estimated cost of each node. (20 marks)