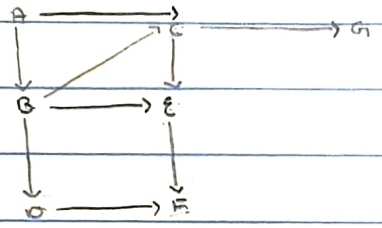
Faiynaq-Syeda SAULAT

2/8/24

CSE 3500 HOMEWORK 3

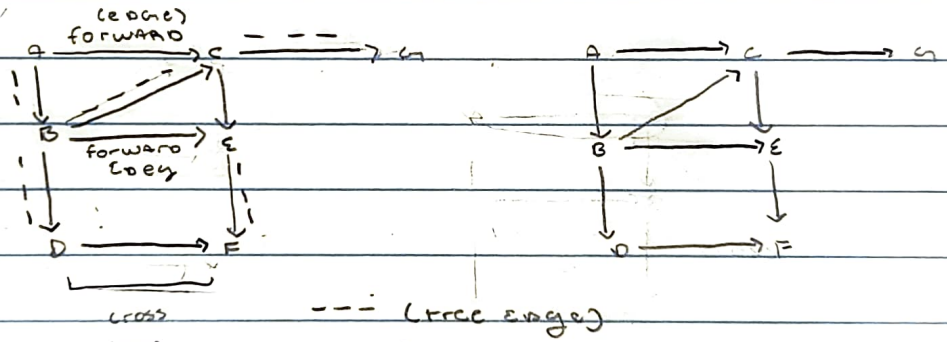
QUESTION 1)



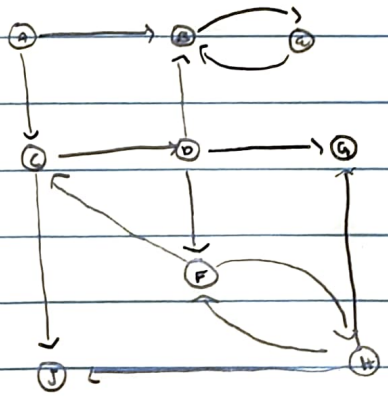
a)

	A	B	C	D	E	F	G
discovery	1	2	3	11	4	5	18
finish	14	13	10	12	8	6	9

b)

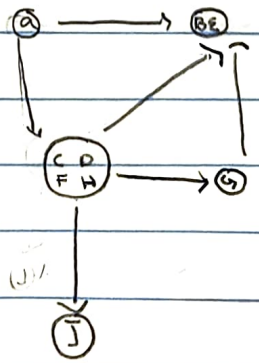


2)



a) (B ⇆ E), (C D F H)

b)



c) A, C D F H, G, B E, J

3) the order would be A, B, C, D, E, F, G, H

- this order is done b/c it is based of of values with no prereqs, then it moves to the next one based on the rewen prereqs or not.

4)

a) the solution is false bc the DFS forest may contain different number of trees/tree edges, dependent on the a) the order in which the vertex is searched, & b) the vertex starting position. [(A) → (B) if the vertex starts at A) will have a tree edge vs if it it starts at B)

b) this statement would be true, this is bc if every vertex (as said in the problem) has a unique shortest path from the starting s in the DFS tree, then there cannot be any cycles within G. there would be other paths to v from s if there was a cycle. therefore if G has no cycles but is connected it must be a tree