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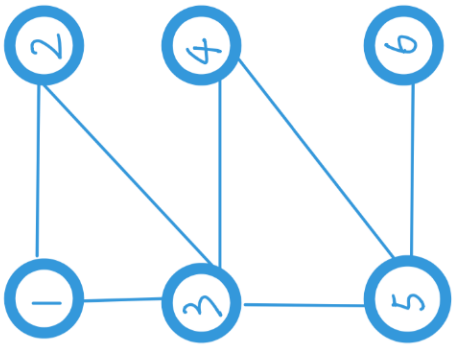
Program Structure and Algorithms (INFO 6205)
Quiz #4 –SAMPLE SOLUTIONS– 30 points

Student NAME:

Student ID:

Question 1 (20 points). *Please refer to the graph G shown below. Break all ties lexicographically (i.e, according to alphabetical order).*



(a) *(8 points) Please execute DFS on G and fill the table below.*

Vertex	*pre*	*post*	*parent/prev*
1	*1*	*12*	*None*
2	*2*	*11*	*1*
3	*3*	*10*	*2*
4	*4*	*9*	*3*
5	*5*	*8*	*4*
6	*6*	*7*	*5*

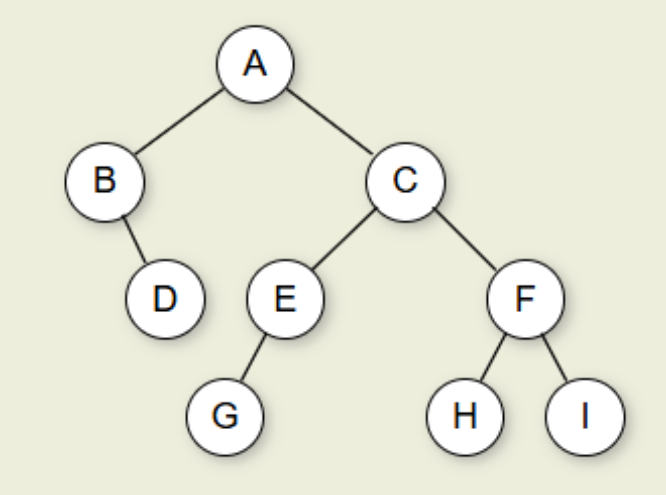
(b) *(2 points) If we remove exactly one edge from G, we obtain two connected components. Identify this edge.*

Edge $(5, 6)$.

(c) *(10 points) Please fill the table below based on executing BFS on G. In the table below $d(\cdot)$ denotes the shortest path length from* 1 *to the vertex.*

Queue	$d(1)$	$d(2)$	$d(3)$	$d(4)$	$d(5)$	$d(6)$
[1]	*0*	∞	∞	∞	∞	∞
[2, 3]	*0*	*1*	*1*	∞	∞	∞
[3]	*0*	*1*	*1*	∞	∞	∞
[4, 5]	*0*	*1*	*1*	*2*	*2*	∞
[5]	*0*	*1*	*1*	*2*	*2*	∞
[6]	*0*	*1*	*1*	*2*	*2*	*3*
[]	*0*	*1*	*1*	*2*	*2*	*3*

Question 2 (10 points). *Please refer to the binary tree T shown below.*



(a) *(9 points) Please list the vertices for preorder, inorder and postorder traversals.*

Preorder: A, B, D, C, E, G, F. H, I

Inorder: B, D, A, G, E, C, H, F, I

Postorder: D, B, G, E, H, I, F, C, A

(b) *(1 point) In which of these traversals do we visit a subtree's root before we visit its children?*

Preorder traversal.