HOMEWORK – GRAPH (QUIZZ – GOOGLE DOCS)

EDITOR: *TRƯƠNG QUỐC BÌNH (TEAM 12)*

1. Let G be a graph with n vertices and m edges. What is the tightest upper bound on the running time on Depth First Search of G? Assume that the graph is represented using adjacency matrix. *

A. O(mn)

B. O(m+n)

C. O(n^2)

D. O(n)

2. Suppose depth first search is executed on the graph below starting at some unknown vertex. Assume that a recursive call to visit a vertex is made only after first checking that the vertex has not been visited earlier. Then the maximum possible recursion depth (including the initial call) is _____. *

A. 17

B. 18

C. 19

D. 20

3. Which one of the following cannot be the sequence of edges added, in that order, to a minimum spanning tree using Kruskal's algorithm? *

A. (a—b),(d—f),(b—f),(d—c),(d—e)

B. (a—b),(d—f),(d—c),(b—f),(d—e)

C. (d—f),(a—b),(d—c),(b—f),(d—e)

D. (d—f),(a—b),(b—f),(d—e),(d—c)

4. The number of distinct minimum spanning trees for the weighted graph below is ____ *

A. 4

B. 5

C. 6

D. 7

5. Let G be an undirected graph. Consider a depth-first traversal of G, and let T be the resulting depth-first search tree. Let u be a vertex in G and let v be the first new (unvisited) vertex visited after visiting u in the traversal. Which of the following statements is always true? *

A. {u,v} must be an edge in G, and u is a descendant of v in T

B. {u,v} must be an edge in G, and v is a descendant of u in T

C. If {u,v} is not an edge in G then u is a leaf in T

D. If {u,v} is not an edge in G then u and v must have the same parent in T