EXAM EXERCISES	December, 21th 2016

EXERCISES:

1. Given the weighted and directed graph G = (V,E), with V = {a, b, c, …, h} and E determined by the following edges list:

(a,d)	(a,f)	(d,h)	(d,f)	(h,e)	(h,g)	(e,g)	(f,g)	(f,b)	(f,c)	(b,c)
1	2	1	6	2	7	2	3	4	5	2

a) Draw the graph G.

b) Write the depth-first traversal over G, starting with vertex **a**.

c) Write one topological ordering for the vertices of G.

d) Draw a minimum spanning tree of the undirected underlying graph, indicating its total weight.

e) Draw the tree with the shortest paths from vertex **a** to all other vertices of the graph, indicating for each vertex the minimum distance calculated.

2. Given the weighted and directed graph G = (V,E), with V = {1, 2, 3, … , 8} and E determined by the following edges list:

(1,2)	(1,3)	(2,7)	(3,2)	(3,4)	(3,5)	(3,7)	(4,5)	(4,8)	(5,6)	(5,8)	(7,5)	(7,6)	(8,6)
5	2	2	3	4	2	1	3	1	2	1	1	4	2

Draw the graph avoiding edges crossing, and then draw:

a) A tree associated to a depth-first traversal starting with vertex **1**.

b) A tree associated to a breath-first traversal starting with vertex **1**.

c) A minimum spanning tree of the undirected underlying graph, indicating its total weight.

d) A tree with the shortest paths from vertex **1** to all other vertices of the graph, indicating for each vertex the minimum distance calculated.

e) A modification of the graph where their vertices are aligned and ordered topologically.