Question 1:

a. Adjacency matrix

	0	1	2	3	4	5	6
0	0	2	1	1	INF	INF	INF
1	INF	0	INF	3	4	INF	INF
2	INF	INF	0	INF	INF	5	INF
3	INF	INF	2	0	2	2	8
4	INF	INF	INF	INF	0	INF	5
5	INF	INF	INF	INF	INF	0	INF
6	INF	INF	INF	INF	INF	1	0

b. Adjacency list

$G = (V, E)$

$V = \{0, 1, 2, 3, 4, 5, 6\}$

$E = \{(0,1), (0,2), (0,3), (1,3), (1,4), (2,5), (3,2), (3,4), (3,5), (3,6), (4,6), (6,5)\}$

$n = |V| = 7$

$m = |E| = 12$

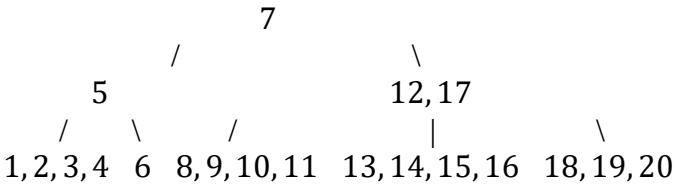
c. Memorized Shortest Path algorithm

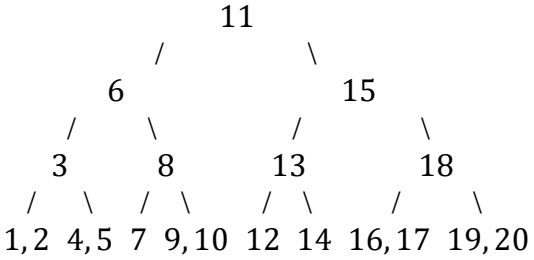
Key	$Value$
0	INF
1	INF
3	INF

Cannot reach 2 from 4

d. When running with a circle, the program will never terminates, because when coming out from a point, it will go back to itself by this algorithm.

Question 4:


7
5
12, 17
1, 2, 3, 4
6
8, 9, 10, 11
13, 14, 15, 16
18, 19, 20


11
6
15
3
8
13
18
1, 2
4, 5
7
9, 10
12
14
16, 17
19, 20