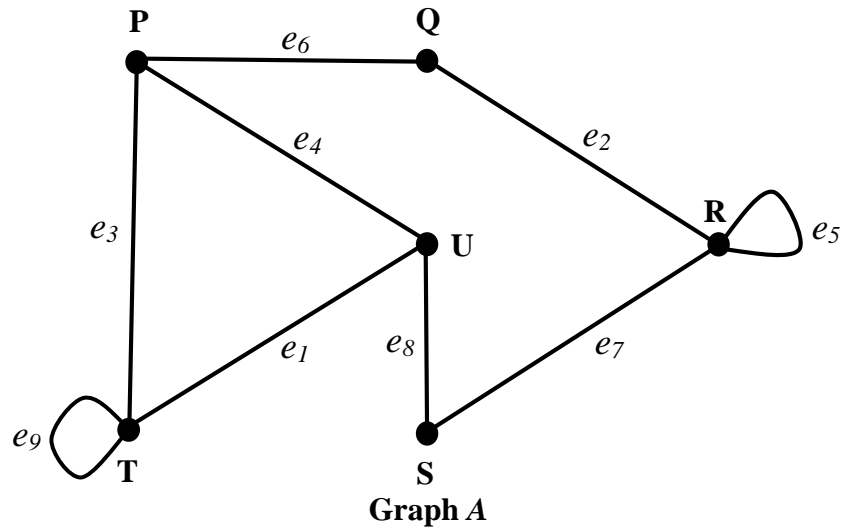


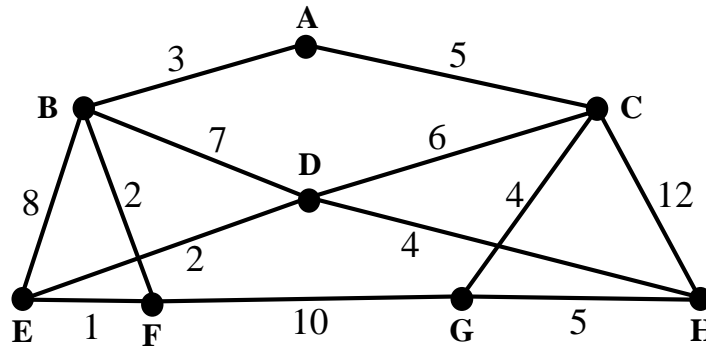
Question 1

1. Refer to the weighted graph *A* below;



Determine whether Graph *A* has an Euler Cycle or Euler Path. Justify your answer. If the cycle/path exists, indicate the cycle/path.

2. Use Dijkstra's algorithm to find the length of a shortest path between vertex A to H.



3. Answer the questions based on the incidence matrix for Graph *B* below.

	e1	e2	e3	e4	e5	e6	e7
A	1	0	0	0	0	0	1
B	1	0	1	0	0	0	0
C	0	0	1	0	1	1	0
D	0	1	0	1	1	0	0
E	0	1	0	0	0	1	0

- List the vertex in Graph *B* that has a self-loop.
- Calculate the sum of degrees for Graph *B*.

Question 2

1. Given a series of numbers in the following order;

87, 21, 45, 100, 65, 19, 90, 120, 105, 20, 33.

- Create a binary search tree, by inserting the number listed in the order given.
 - List the order in which the vertices are processed using Preorder Traversal, Inorder Traversal and Postorder Traversal.
2. A company plans to build a communications network connecting its six computer centres. Any pair of these centres can be linked with a leased telephone line. Use Kruskal's algorithm to design a minimum-cost communications network connecting all computers represented by the graph in Figure 1.

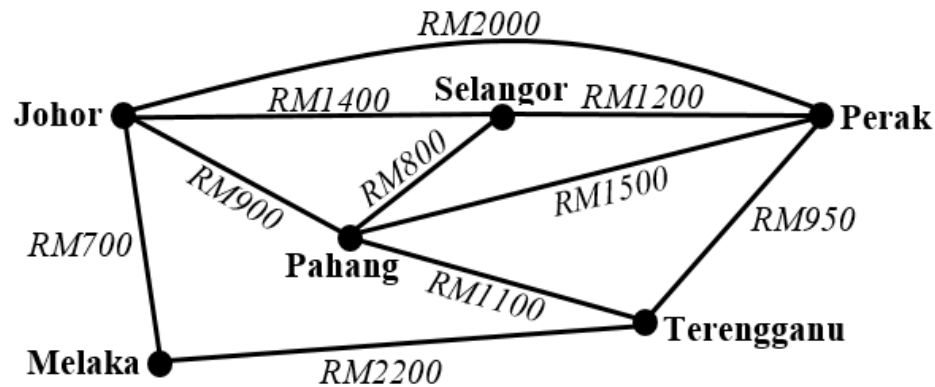


Figure 1

3. Consider the finite-state automaton M , shown in Figure 2:

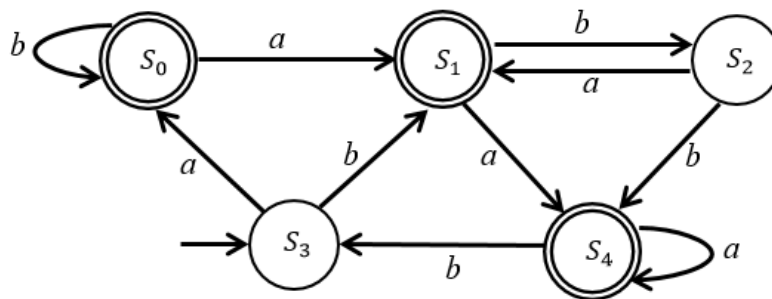


Figure 2

- What are the initial state and accepting state(s) of M ?
- Provide a finite-state table for M that consist of columns of *states* (S), a *transition function* (f) and an *output function* (g).
- Based on the transition diagram, find the output string for the given input string and determine whether the given string is accepted or not.

a a b a a b b