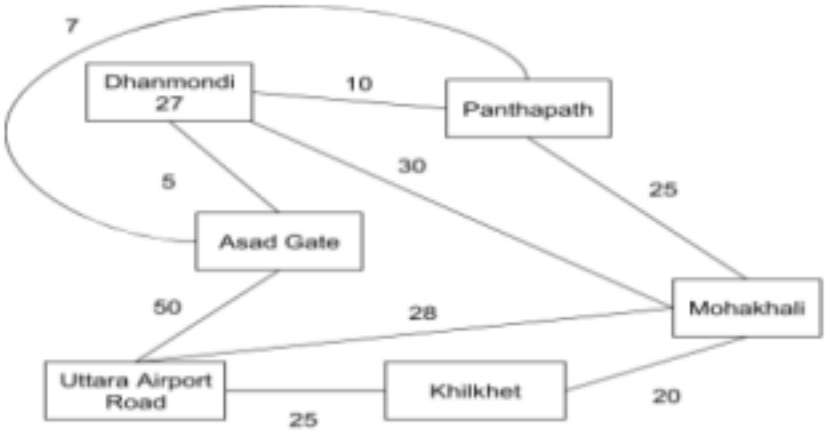
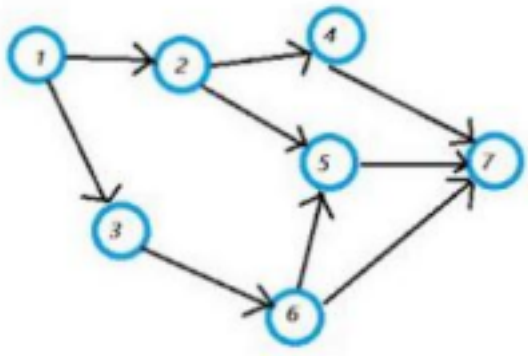
Question 1)

The graph below shows potential bus routes in Dhaka city for the BRAC University staff buses. The weights are the level of traffic between different pick up points. Apply a suitable algorithm to design the final bus routes to minimize the cost of traffic.



Qustion 2) Simulate Topological sort on the graph below. Show each step clearly. Show the sorted order.



Question 3)

The table shows the distances, in units of 100 m, between seven houses, A to G.

	A	B	C	D	E	F	G
A	0	4	5	3	2	5	6
B	4	0	1	2	4	7	6
C	5	1	0	3	4	6	7
D	3	2	3	0	2	6	4
E	2	4	4	2	0	6	6
F	5	7	6	6	6	0	10
G	6	6	7	4	6	10	0

Use Prim's algorithm on the table in the insert to find a minimum spanning tree. Start by crossing out row A. Show which entries in the table are chosen and indicate the order in which the rows are deleted. Draw your minimum spanning tree and state its total weight.

Question 4 a)

You are invited to your friend's birthday treat at Chef's Table Courtyard. Your friend has given a budget of $100 for each person. You are allowed to take the food as a whole or eat a portion from it.

Apply proper technique to find the maximum calorie you can eat.

Food	Price in $	Calories
Fish and Chips	10	2000
Rib-Eye Steak	30	2500

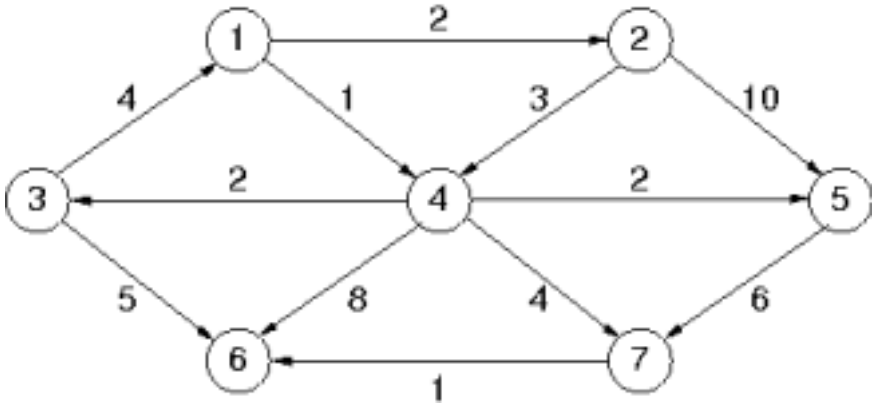
Sea Food Platter	20	2900
Tomahawk Steak	40	3000
Whole Mutton Roast	30	2300

Question 4 b)

Your friend has changed his mind. You are no longer allowed to waste any food and You have to eat the chosen food completely. From the table above, apply proper technique to find the maximum calorie you can eat.

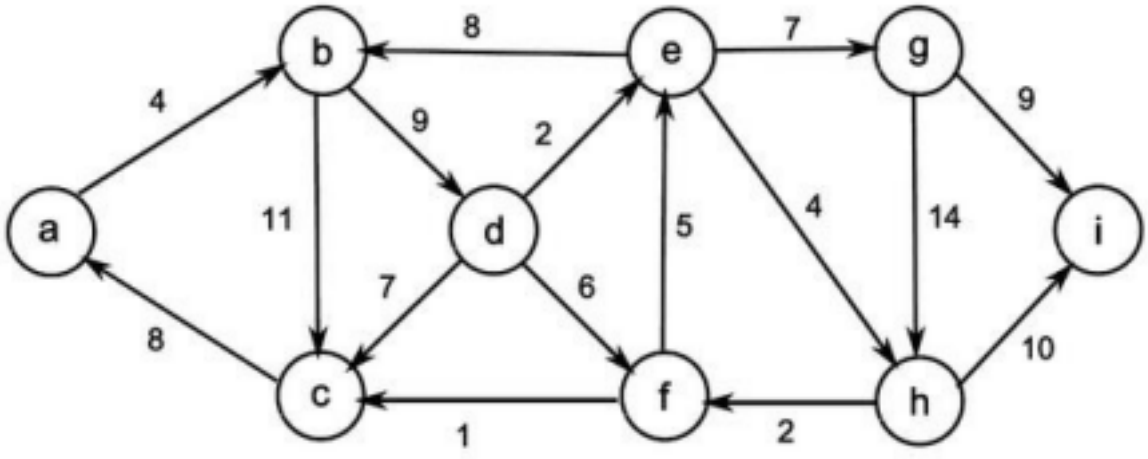
Question 5)

Apply Dijkstra Algorithm to find the shortest path from Node 3 to Node5. Show Proper Simulation.



Question 6)

Find the shortest path from Node (a) to Node (i). Show the steps properly.



Question 7)

Consider the following line, “ Eerie eyes seen near lake ”.

a) Count the frequency of each character in the line.
b) Encode the following line using Huffman Coding algorithm.

Question 8)

Find the Longest Common Subsequence between String 1= “ AGACTGTC ” and string 2= “ TAGTCACG ”