Alexandria University
—— Faculty of Engineering ——
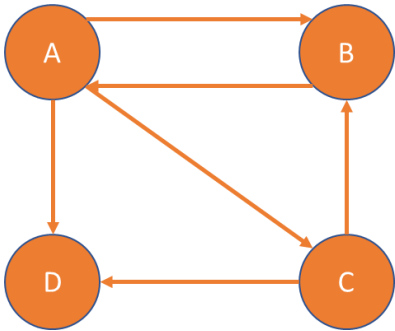
Assignment NO. 6

By:

Ali Mohamed Taima Hummus
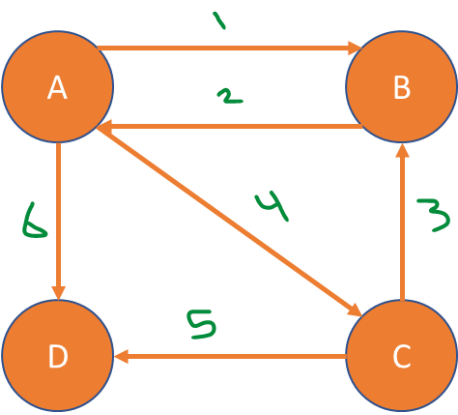
Question1:

a)

b)

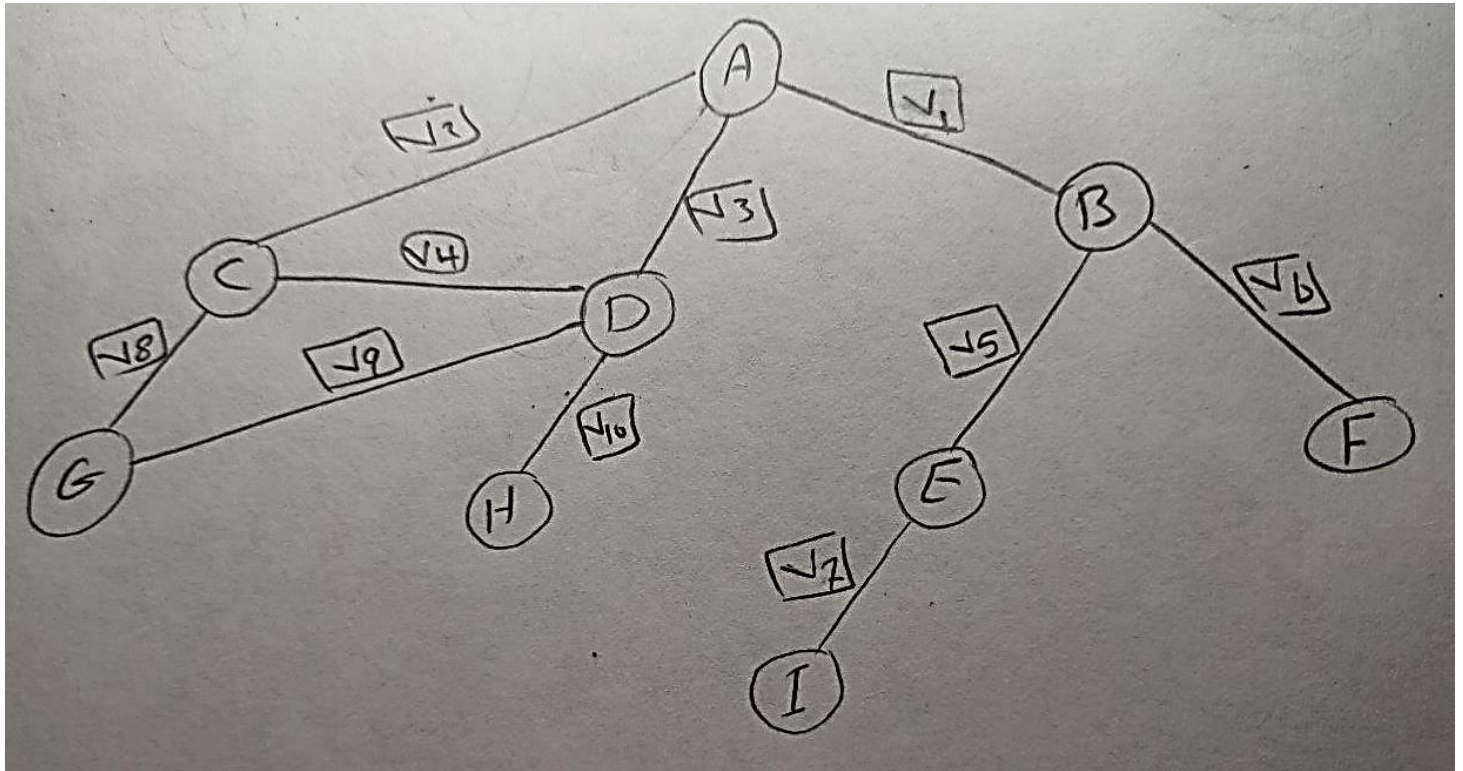|	A	B	C	D
A	0	1	1	1
B	1	0	0	0
C	0	1	0	1
D	0	0	0	0

c)

source	destination	edge
A	B	1
A	C	4
A	D	6
B	A	2
C	B	3
C	D	5

Question2:

a)

b)

	A	B	C	D	E	F	G	H	I
A	0	1	1	1	0	0	0	0	0
B	1	0	0	0	1	1	0	0	0
C	1	0	0	1	0	0	1	0	0
D	1	0	1	0	0	0	1	1	0
E	0	1	0	0	0	0	0	0	1
F	0	1	0	0	0	0	0	0	0
G	0	0	1	1	0	0	0	0	0
H	0	0	0	1	0	0	0	0	0
I	0	0	0	0	1	0	0	0	0

c)

	A	B	C	D	E	F	G	H	I
A	0	1	1	1	0	0	0	0	0
B	1	0	0	0	1	1	0	0	0
C	1	0	0	1	0	0	1	0	0
D	1	0	1	0	0	0	1	1	0
E	0	1	0	0	0	0	0	0	1
F	0	1	0	0	0	0	0	0	0
G	0	0	1	1	0	0	0	0	0
H	0	0	0	1	0	0	0	0	0
I	0	0	0	0	1	0	0	0	0

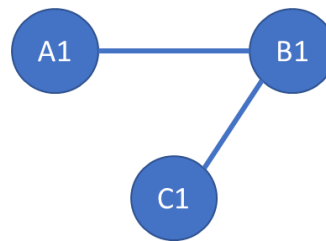YES, because it undirected graph and the edge is for

d)

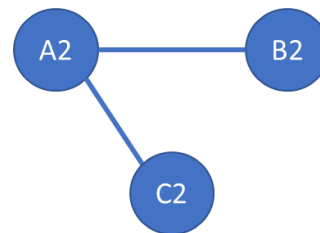It will be the number out-edges of vertex

Question3:

a)

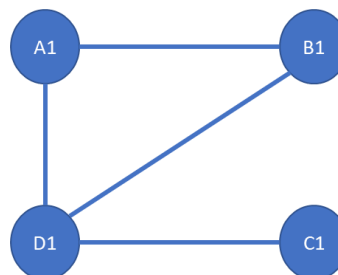|	A1	B1	C1
A1	0	0	1
B1	0	0	1
C1	1	1	0

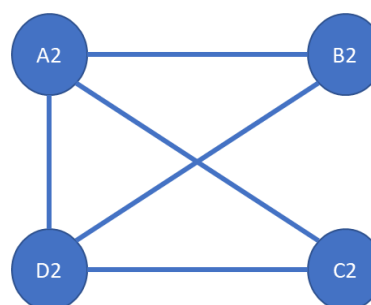|	A2	B2	C2
A2	0	1	1
B2	1	0	0
C2	1	0	0

- The two graphs are isomorphism
  - Because the Isomorphism f from first to second graph is: f(B1) = A2, f(A1) = B2, f(C1) = C2

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b)

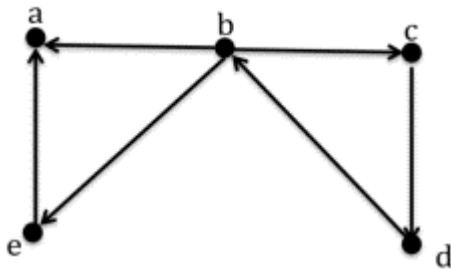|	A1	B1	C1	D1
A1	0	1	0	1
B1	1	0	0	1
C1	0	0	0	1
D1	1	1	1	0

	A2	B2	C2	D2
A2	0	1	1	1
B2	1	0	0	1
C2	1	0	0	1
D2	1	1	1	0

- The two graphs are not isomorphism
  - Because the number of edges of the first graph are 4 but in second graph are 5
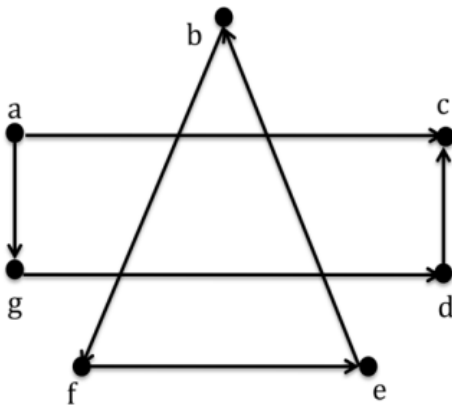
Question4:

a)

This graph is **weakly** connected, because **there is** a **path from b** to **a** but there is **no path** from **a** to **b**, and **there is** a **path from b** to **e** but there is **no path** from **e** to **b**

We can call the **subgraph acd** is a **strongly** connected, because there are paths between all possible pairs of vertices
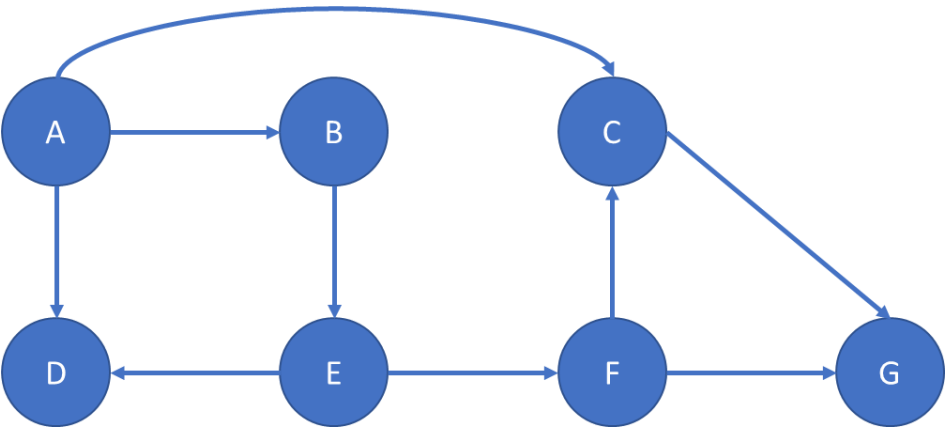
b)

This graph is **NOT** connected

We can call **the subgraph acdg** is **weekly** connected, because **there is** a **path from** a to c but there is no path from c to a, path from a to g but no path from g to a, path form d to c but no path from c to d and so on

We can call the **subgraph afe** is a **strongly** connected, because there are paths between all possible pairs of vertices
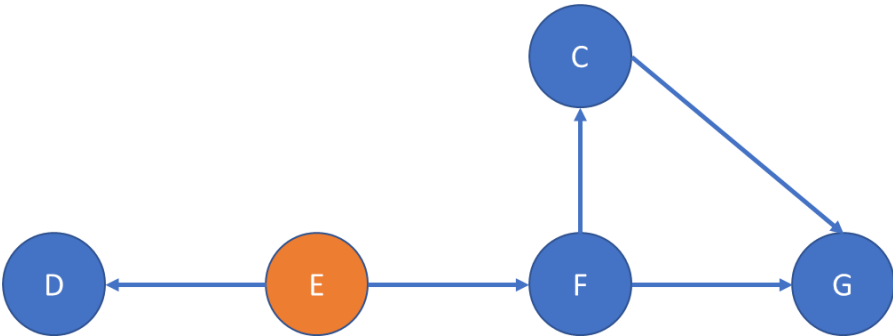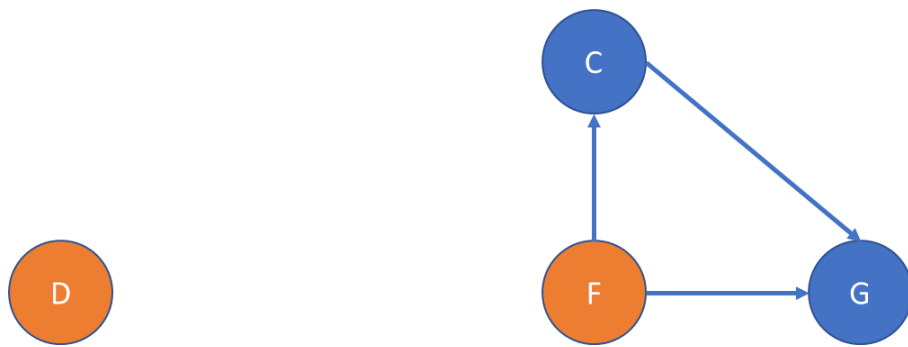
Question5:

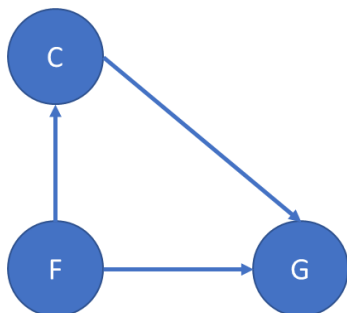| Vertex	A	B	C	D	E	F	G	output
Removed	NO	NO	NO	NO	NO	NO	NO	
In-degree	0	1	2	2	1	1	2	
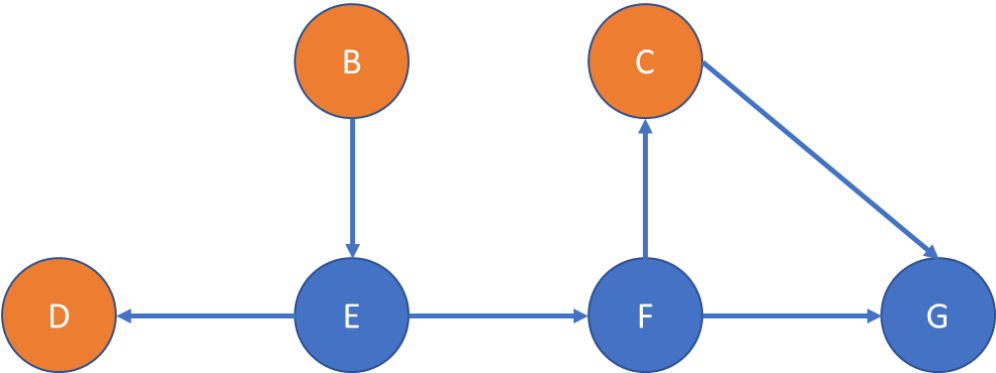
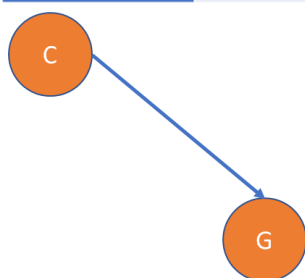| Vertex	A	B	C	D	E	F	G	output
Removed	YES	NO	NO	NO	NO	NO	NO	**A**
In-degree		0	1	1	1	1	2	

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	NO	NO	NO	NO	NO	**A, B**
In-degree			1	1	0	1	2	

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	NO	NO	YES	NO	NO	**A, B, E**
In-degree			1	0		0	2	

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	NO	YES	YES	NO	NO	**A, B, E, D**
In-degree			1			0	2	

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	NO	YES	YES	YES	NO	**A, B, E, D**
In-degree			0				1	**F**

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	YES	YES	YES	YES	NO	**A, B, E, D**
In-degree							0	**F, C**

Vertex	A	B	C	D	E	F	G	output
Removed	YES	YES	YES	YES	YES	YES	YES	**A, B, E, D**
In-degree								**F, C, G**

The final ouptup is: A, B, E, D, F, C, G