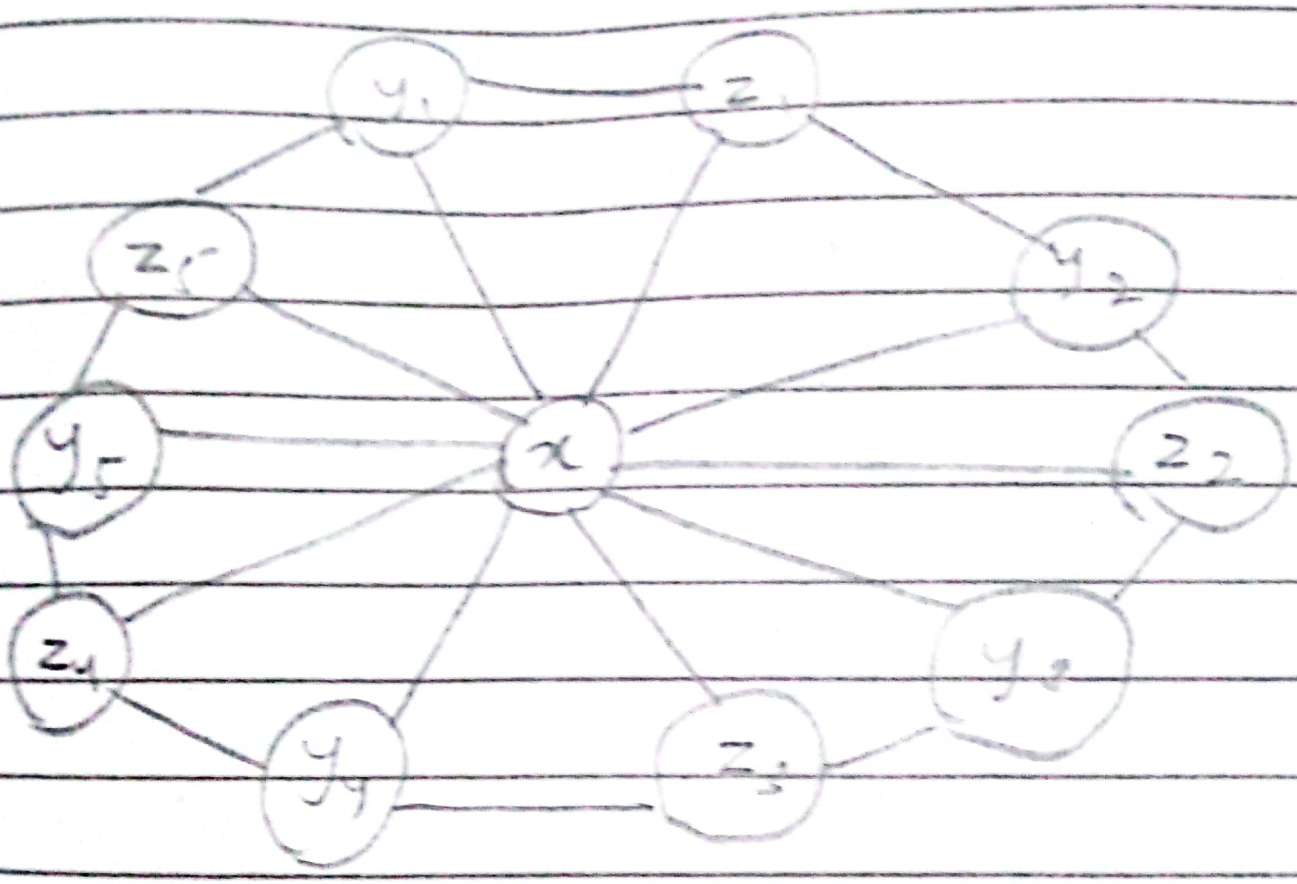
Q1 (a) F_5 , $n = 5$, $2n+1 = 11$



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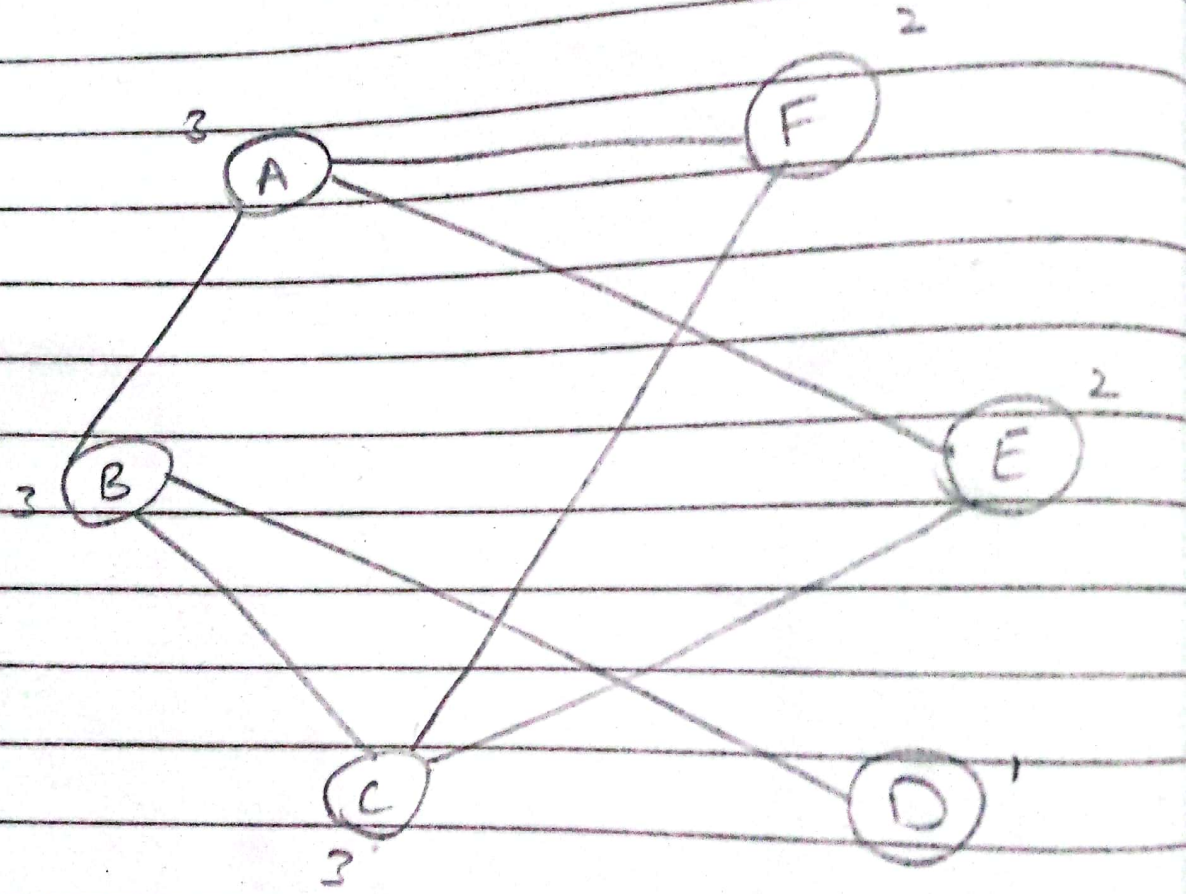
(b) $v = 6$



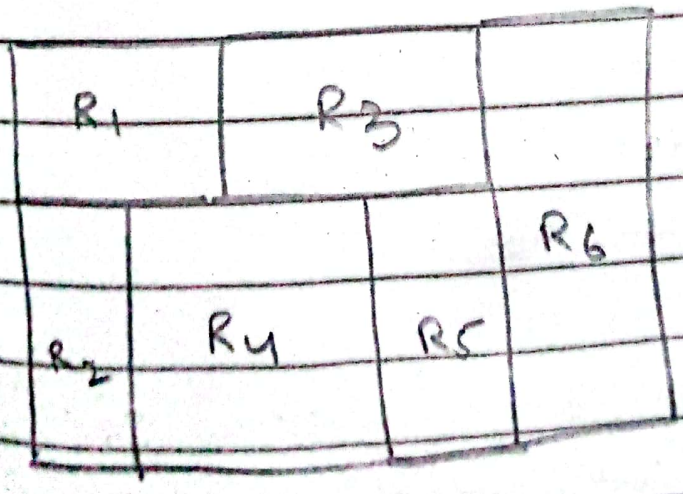
sum(d) = 14

Date

(c) room = 6

adjancency Matrix :

	1	2	3	4	5	6
1	0	1	1	1	0	0
2	1	0	0	1	1	0
3	1	0	0	1	1	1
4	1	1	1	0	1	0
5	0	1	1	1	0	1
6	0	0	1	0	1	0



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(d)

$m = 5$

	1	2	3	4	5
1	0	1	1	1	1
2	1	0	1	1	1
3	1	1	0	1	1
4	1	1	1	0	1
5	1	1	1	1	0

Q2

(a)

(a) Not

(b) Not

(c) Yes

(d) ~~Yes~~ Not

(i) (a) Not all vertices and adjacent edge found in right side.

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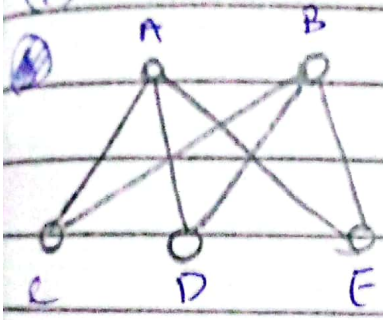
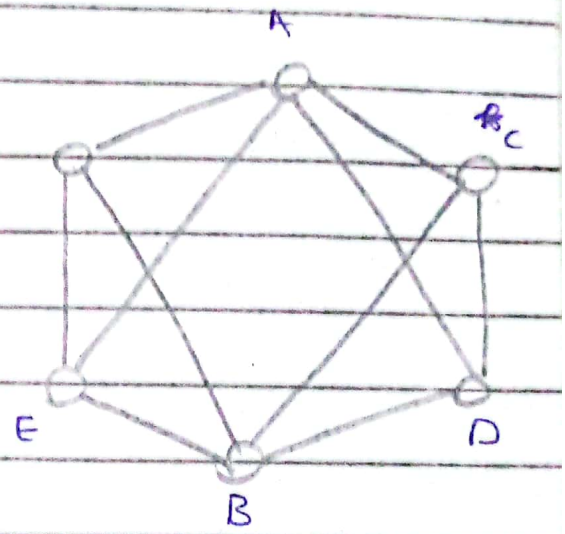
(b) 3 vertice are found but the last 4th. vertex does not have the corresponding edge.

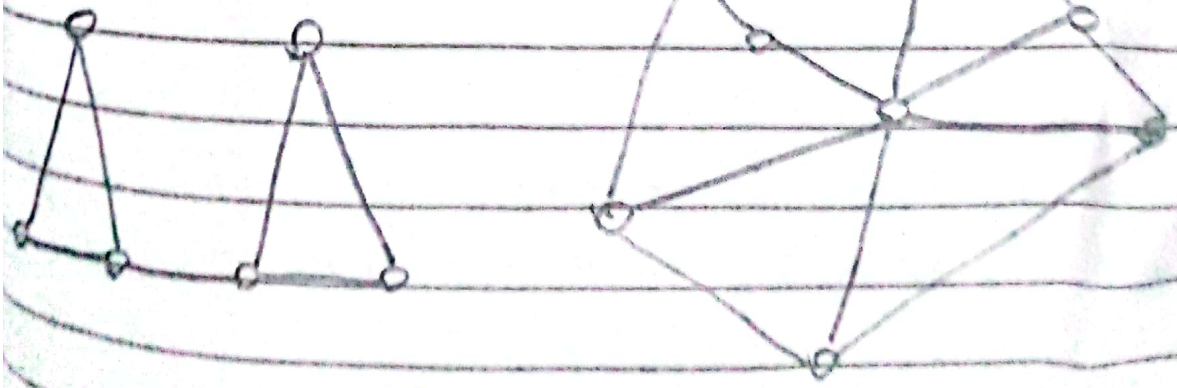
(i)



(c)



(d)



Not a sub graph

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Q2

(b)

By using Handshaking lemma:

$\sum deg(v) = 2E$

(i)

$E = 28$, $v = 12$ (3, 4)

Min = $12 \times 3 = 36$ } edges

Max = $12 \times 4 = 48$

where,

org = $2(28) = 56$

should be

=> Not Possible

(ii) (3 or 6)

Min = $12 \times 3 = 36$

Max = $12 \times 6 = 72$

org $\sum deg(v) = 56$,

so, it is possible.

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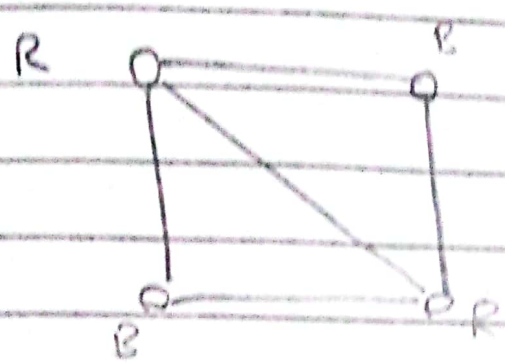
Q2

(c)

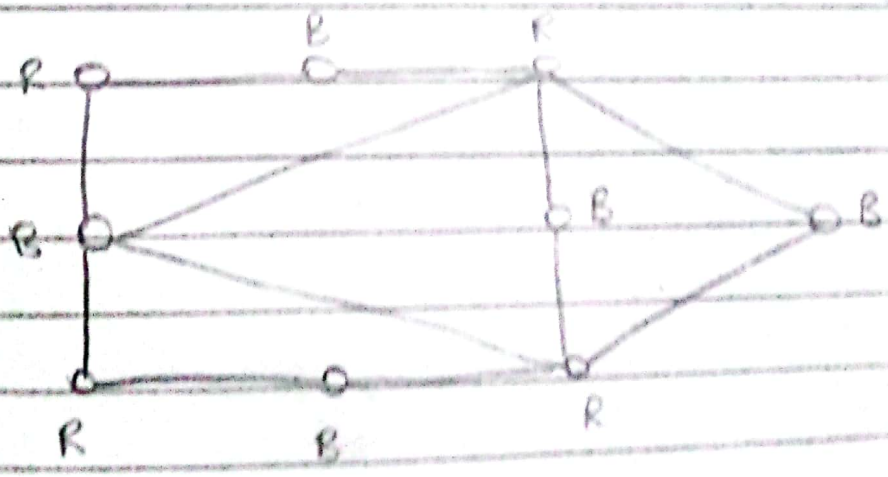
(a) Not bipartite



R-R are adjacent

(b) Yes. bipartite.

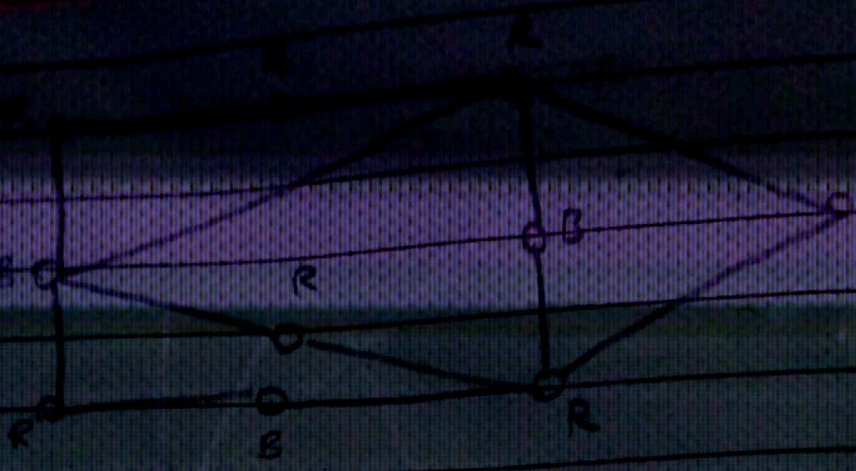
(c)



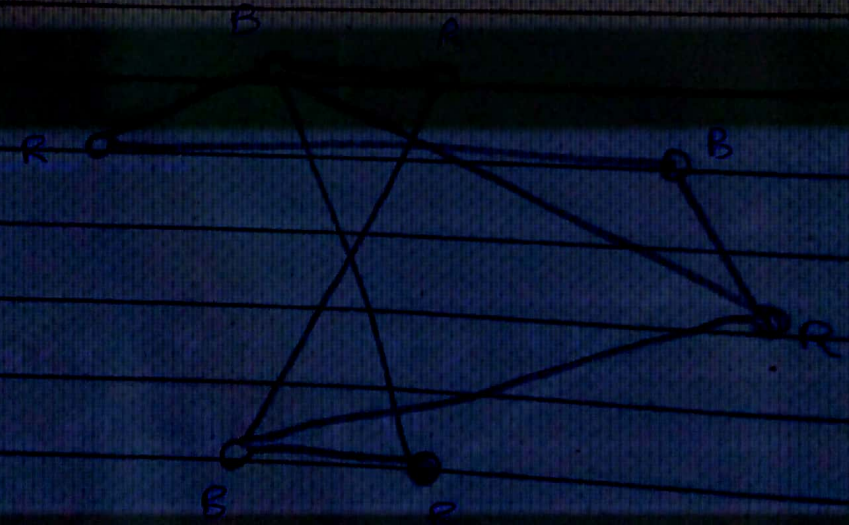
graph is Bipartite.

Name

No.



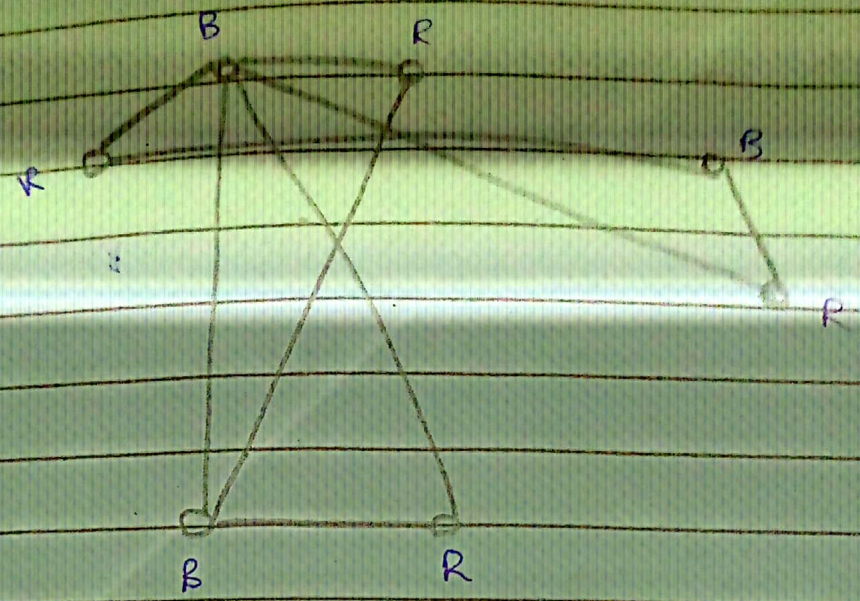
R-R Not Bipartite.



Graph is Bipartite

Date

(f)



B - B graph is not Bipartite.

Q3

(a) (i)

(a) $G_1 = 2\,3\,3\,2\,2\,1\,1$

$\Rightarrow 3\,3\,2\,2\,1\,1$

$G_2 = 1\,3\,1\,1\,3\,2\,2$

$3\,3\,2\,2\,1\,1\,1$

(b) $G_1 = 3\,3\,2\,2\,1\,1$

$G_2 = 2\,3\,1\,1\,3\,2\,2$

$= 3\,3\,2\,2\,1\,1$

Signature

Q4

No.

Date

(c) $G_1 = 1\,3\,1\,2\,2\,1$

$= 3\,2\,2\,1\,1\,1$

$G_2 = 1\,2\,3\,1\,2\,1$

$= 3\,2\,2\,1\,1\,1$

(ii)

(a) Deg sequence is not same so the graphs are not isomorphic.

(b) Graphs are isomorphic.

Vertices

A = P

B = t

E = q

C = u

F = r

D = v

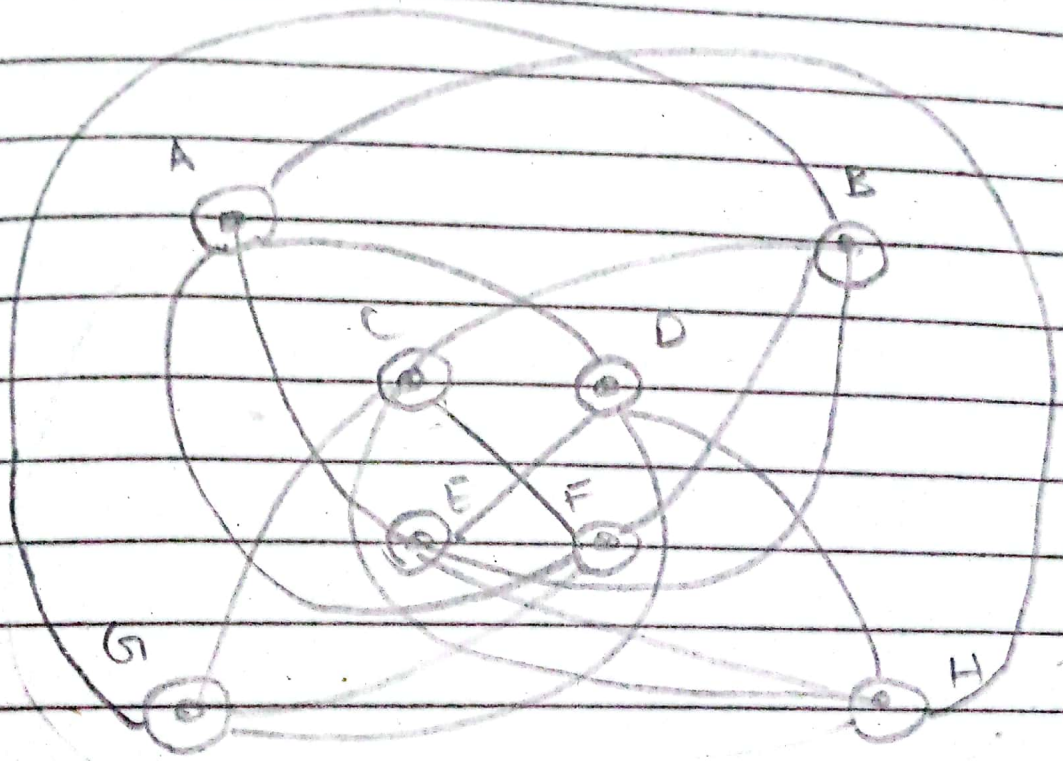
G = s

Date

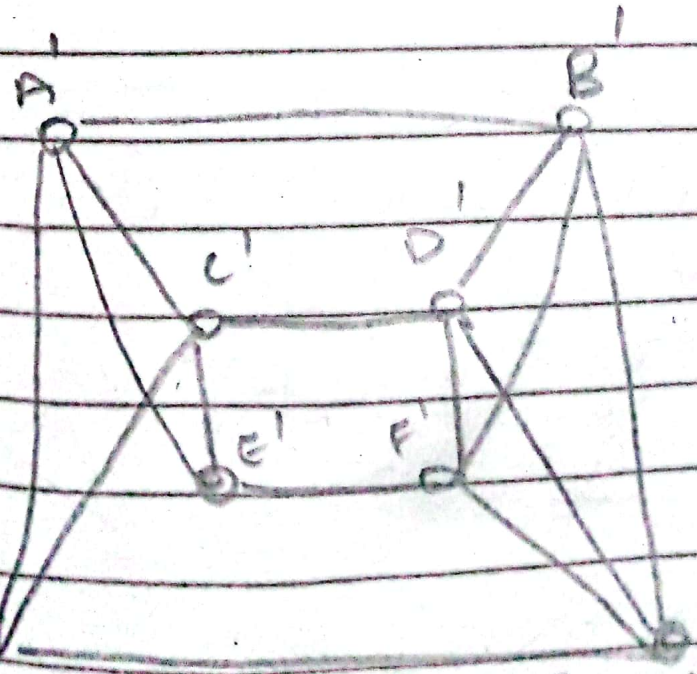
(c)

Cannot be mapped on each other even though the sequence is same.

(b)



Seq = 4 4 4 4 4 4 4 4



Seq = 4 4 4 4 4 4 4 4

A = B'

B = A'

H = G'

G = H'

C = F'

F = C'

D = E'

Signature

No.

Seq is same graphs are isomorphic

Q4

(a) (i)

$G_1 = 4\,4\,4\,4\,4\,4\,4$

$G_2 = 4\,4\,4\,5\,3\,4\,4$

$\Rightarrow 5\,4\,4\,4\,4\,4\,3$

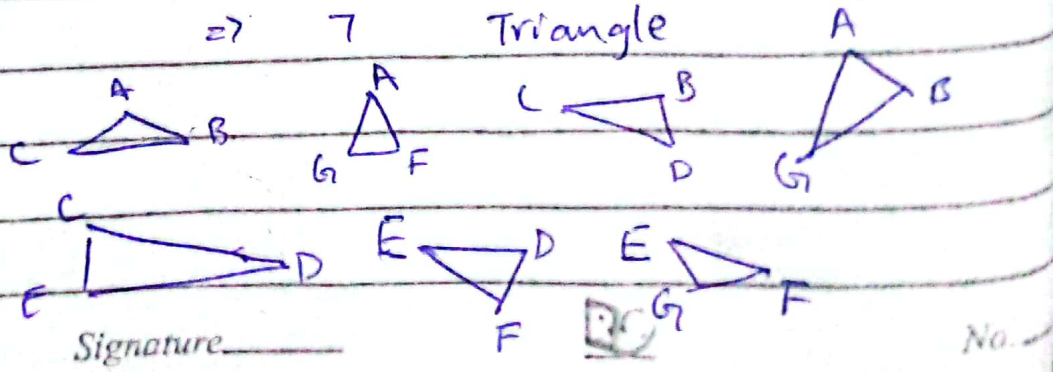
$G_3 = 4\,4\,4\,3\,4\,5\,4$

$= 5\,4\,4\,4\,4\,4\,3$

(ii)

G_1 : ACB, AGF, BCD, BA, G, CED, DFF, FEG,

$\Rightarrow$ 7 Triangle



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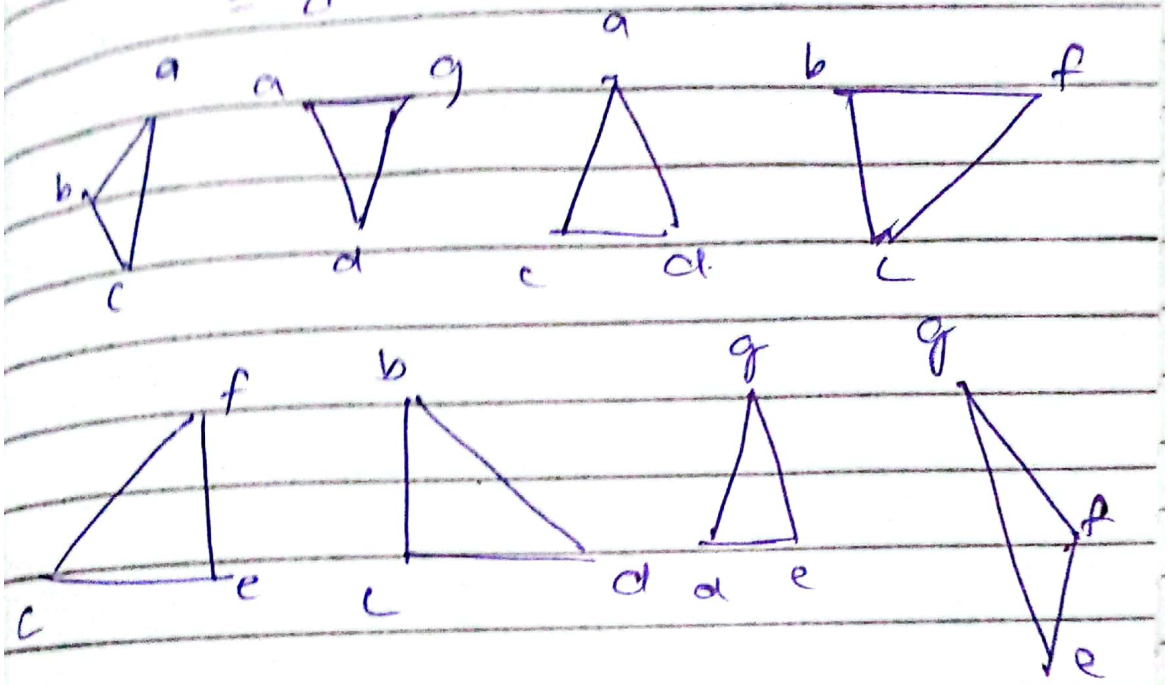
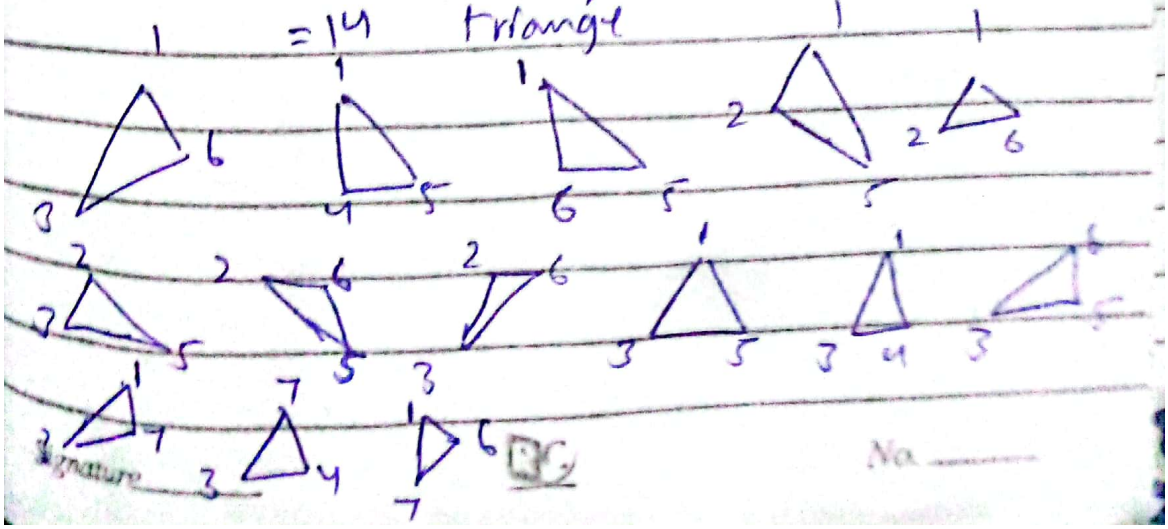
G2: abc, adg, acd, bfc, cfe, dbc, deg, feg

= 8



G3: 136, 145, 156, 251, 261, 235, 256, 236, 351, 341, 356, 371, 473, 671

= 14 triangle



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Q4 (b)

$\sum deg(v) = 2E$

$= 2(62) = 124$

$v = 20, \quad E = 62,$

(3 or 7)

$7x$ — vertices with deg 7

$3(20-x)$ — vertices with deg 3

$7x + 3(20-x) = 124$

$\Rightarrow \quad 7x + 60 - 3x = 124$

$\Rightarrow \quad 4x + 60 = 124$

$4x = 64$

$x = 16$

$\Rightarrow$ 16 vertices with degree 7.

Signature

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Q5

$$\text{Beta}_{\text{ind}} = \frac{\text{No. edges}}{\text{vertices}}$$

(a)

Gr1 :

$$\text{Beta}_{\text{ind}} = \frac{7}{5} = 1.167$$

Gr 2

$$\text{Beta}_{\text{ind}} = \frac{7}{7} = 1$$

(b) verifying by Havel-Hakemi method,

(i)

~~6~~, 5, 4, 4, 3, 2

Not graphical

(ii) ~~6~~, 6, 4, 2, 2, 2, (1) 1

5, 3, 1, 1, 1, 0, 1

~~5~~, 3, 1, 1, 1, (1) 0 Not graphical

~~2~~, 0, (0) 0, 0, 0

-1, -1, 0, 0, 0

Signature

No.

(iii) ③ 3, 3, ③ 3, 3

2, 2, 2, 3, 3

3, 3, 2, ② 2

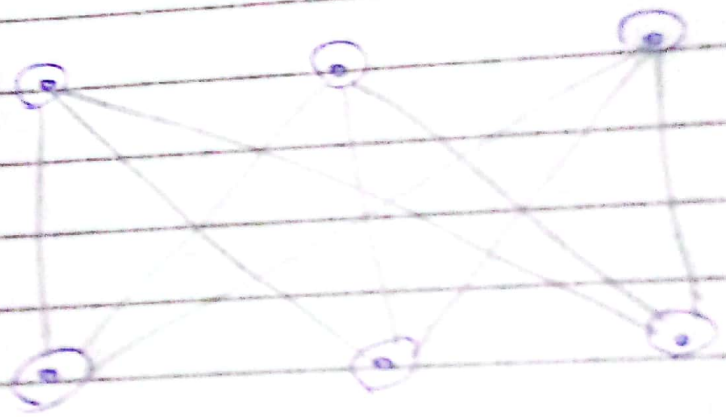
2, 1, 1, 2

2, 2, ①

1, 0, 1

1, 1, 0

Complement



(c)

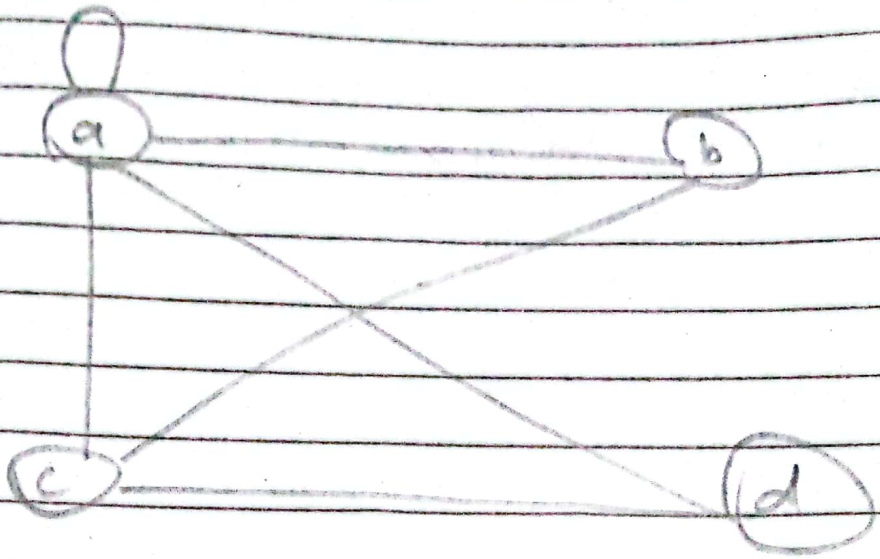
clique size => 4

max independent = 2

set

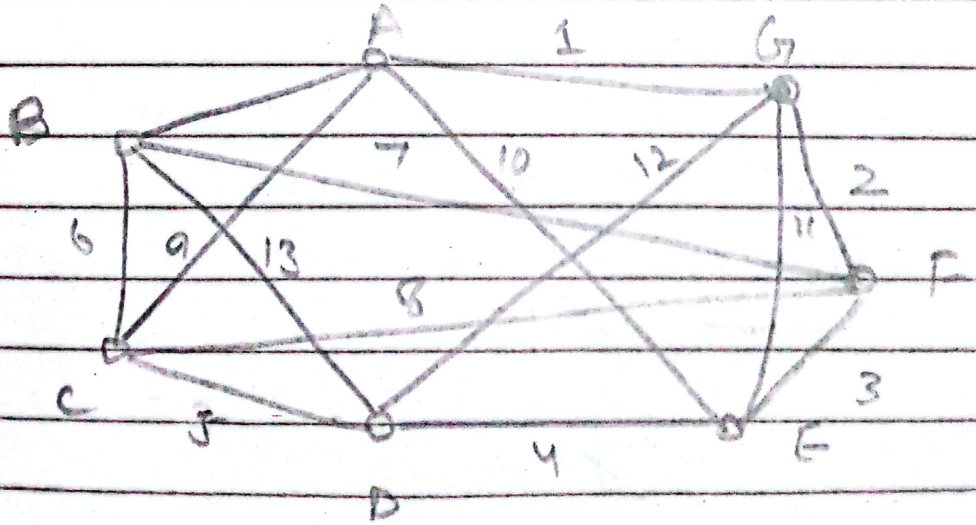
Date

(d)



Q# 6

(a) (a) Graph is eucleriam as



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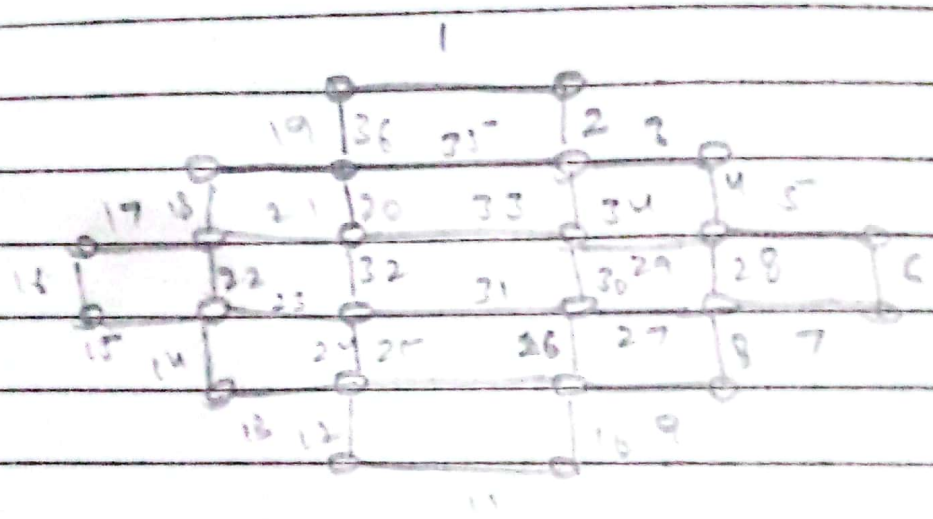
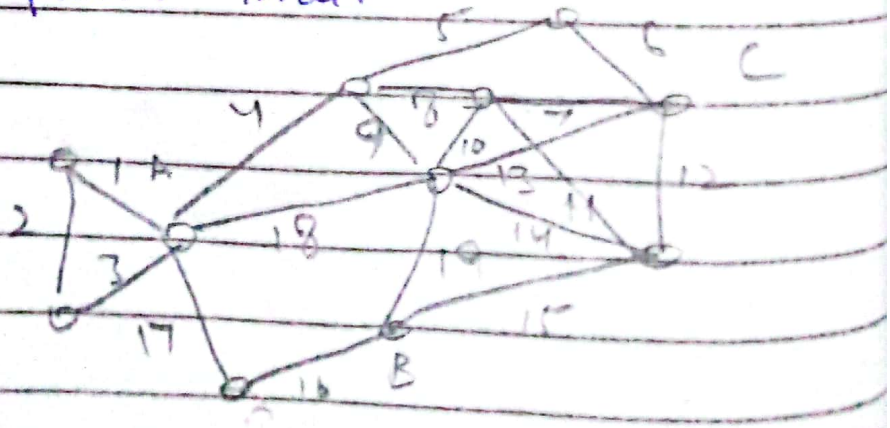
(b) every vertex is having even degree, the graph is eucleriam.



Q6(b) Exactly 2 vertice have odd degree & there must be an eucleriam ~~path~~. Trial.



Signature

No

Date _____

7

Q7)

(i) The graph is Hamiltonian

A → E → B → D → C → A

(ii) Yes there exist a Hamiltonian Path.

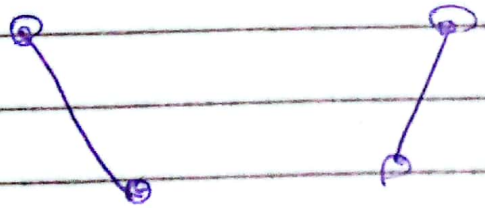
A → E → B → D → C

(iii) Graph is not Eucleriam. it doesn't Have ~~not~~ exactly 2 odd vertices

iv) Graph does not have a Eucleriam trail.

Q8

(i)



(ii) $|S| = 3$ $c(G-S) - 2$

clique size.

(iii) NO $|S|$ is $> c(G-S)$

(iv) Graph ain't hamiltonian.

Signature _____ QC2 No. _____