

No:.....

Date: . . .

Subject:.....

Assignment 3

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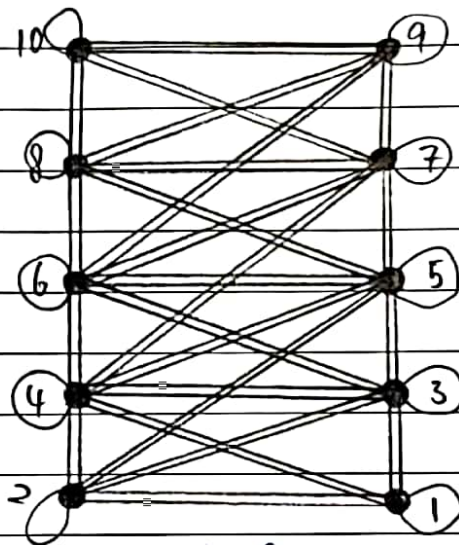
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Assignment 4

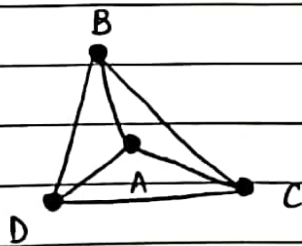
1. $V(G) = \{1, 2, \dots, 10\}$

$10-7$ $9-6$ $8-5$ $7-4$ $6-3$ $5-2$ $4-1$ $3-1$ $2-1$ } and
 $10-8$ $9-7$ $8-6$ $7-5$ $6-4$ $5-3$ $4-2$ $3-2$ } another
 $10-9$ $9-8$ $8-7$ $7-6$ $6-5$ $5-4$ $4-3$ } way

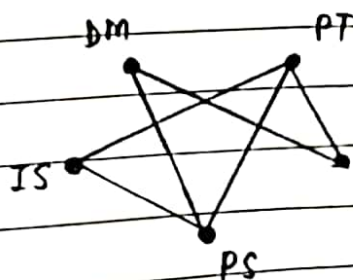
$10-10$ $9-9$ $8-8$ $7-7$ $6-6$ $5-5$ $4-4$ $3-3$ $2-2$ $1-1$

graph G

Number of edges,
 $e(G) = 58$

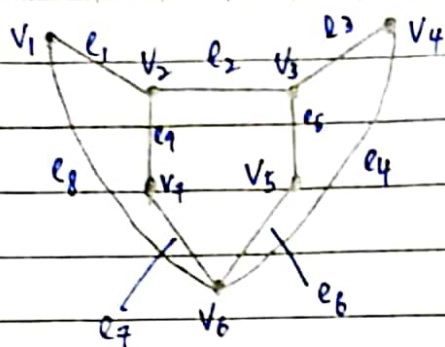
2. (a) A, B, C, D, E Adjacent Matrix, $A_G =$

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

(b) DM, PT, AI, PS, IS Adjacent matrix, $A_G =$

	DM	PT	AI	PS	IS
DM	0	0	1	1	0
PT	0	0	1	1	1
AI	1	1	0	0	0
PS	1	1	0	0	1
IS	0	1	0	1	0

3.



4. Graph G : Adjacent Matrix, A_G

	v_1	v_2	v_3	v_4
v_1	1	0	2	0
v_2	0	0	1	0
v_3	2	1	0	2
v_4	0	0	2	0

Incidence Matrix, I_G

	e_1	e_2	e_3	e_4	e_5	e_6
v_1	2	1	1	0	0	0
v_2	0	0	0	1	0	0
v_3	0	1	1	1	1	1
v_4	0	0	0	0	1	1

Graph H : Adjacent Matrix, A_H

	v_1	v_2	v_3	v_4
v_1	1	0	0	0
v_2	0	1	1	2
v_3	0	1	1	0
v_4	0	2	0	0

Incidence Matrix, I_H

	e_1	e_2	e_3	e_4	e_5	e_6
v_1	2	0	0	0	0	0
v_2	0	2	1	1	1	0
v_3	0	0	0	0	1	2
v_4	0	0	1	1	0	0

5. (a) G_1 and G_2 are isomorphic
 (b) H_1 and H_2 are not isomorphic

6. (a) Trail
 (b) Walk
 (c) Not a walk
 (d) circuit/cycle
 (e) Closed walk
 (f) Path

7. (a) 3

(b) 9

(c) Infinite

8. (a) It has Euler circuit.

$(v_2, e_1, v_1, e_8, v_4, e_7, v_5, e_2, v_2, e_3, v_5, e_6, v_4, e_5, v_3, e_4, v_2)$ is an example of Euler circuit.

(b) It cannot end at the same vertex without using the edge for more than once.

9. (a) There is an Euler path in (a) from u to w .

$(u, v_1, v_0, v_7, u, v_2, v_3, v_4, v_2, v_6, v_4, w, v_6, v_5, w)$ is an Euler path.

(b) There is no Euler path in (b) from u to w .

10. There is no Hamiltonian circuit in graph (a) and graph (b).

11. 3-ary tree

100 vertices

$$m=3, n=100, l=?$$

$$l = n - \frac{(n-1)}{m}$$

$$= 100 - \frac{(100-1)}{3}$$

$$= 100 - 33$$

$$= 67 \text{ leaves}$$

12.a) Root

= a

b) Internal vertices

= b, d, e, g, h, j, n, a

c) Leaves

= c, f, i, k, l, m, r, s, o, p, q

d) Children of n

= r, s

e) Parent of e

= b

f) Siblings of k

= l, m

g) Proper ancestors of q

= a, d, i

h) Proper descendants of b

= e, f, g, k, l, m, n, r, s

13.a) Preorder

= a, b, e, k, l, m, f, g, n, r, s, c, d, h, o, i, j, p, q

b) Inorder

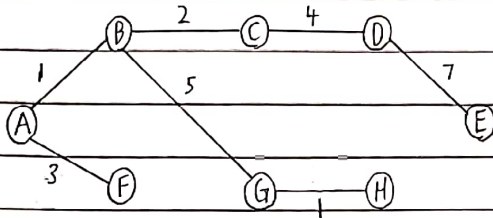
= k, e, l, m, b, f, r, n, s, g, a, c, o, h, d, i, p, q, j

c) Postorder

= k, l, m, e, f, r, s, n, g, b, c, o, h, i, p, q, j, d, a

14.

AB	GH	BC	FA	CD	BF	BG	CG	DH	GD	DE	GF	EH
1	1	2	3	4	4	5	6	6	7	7	8	8



$$\text{Total weight} = 1 + 1 + 2 + 3 + 4 + 5 + 7 = 23$$

15.	No.	S	N	L(M)	L(N)	L(O)	L(P)	L(Q)	L(R)	L(S)	L(T)
	0	{ }	{M, N, O, P, Q, R, S, T}	0	∞	∞	∞	∞	∞	∞	∞
	1	{M}	{N, O, P, Q, R, S, T}	0	4	∞	2	∞	5	∞	∞
	2	{M, P}	{N, O, Q, R, S, T}	0	4	∞	2	6	5	5	∞
	3	{M, P, N}	{O, Q, R, S, T}	0	4	10	2	6	5	5	∞
	4	{M, P, N, R}	{O, Q, S, T}	0	4	7	2	6	5	5	6
	5	{M, P, N, R, S}	{O, Q, T}	0	4	7	2	6	5	5	6
	6	{M, P, N, R, S, Q}	{O, T}	0	4	7	2	6	5	5	6
	7	{M, P, N, R, S, Q, T}	{O}	0	4	7	2	6	5	5	6

Minimum distance from M to T = 6

Shortest path is $M \rightarrow R \rightarrow T$.