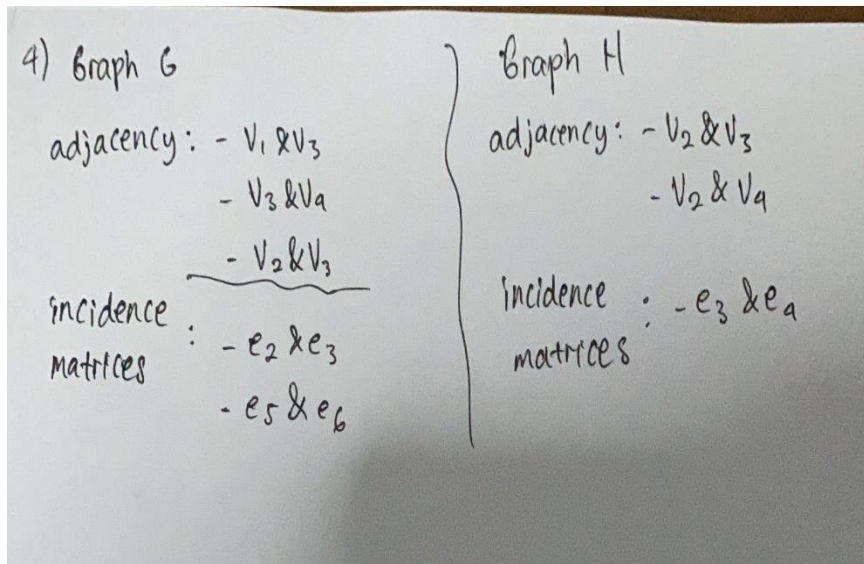
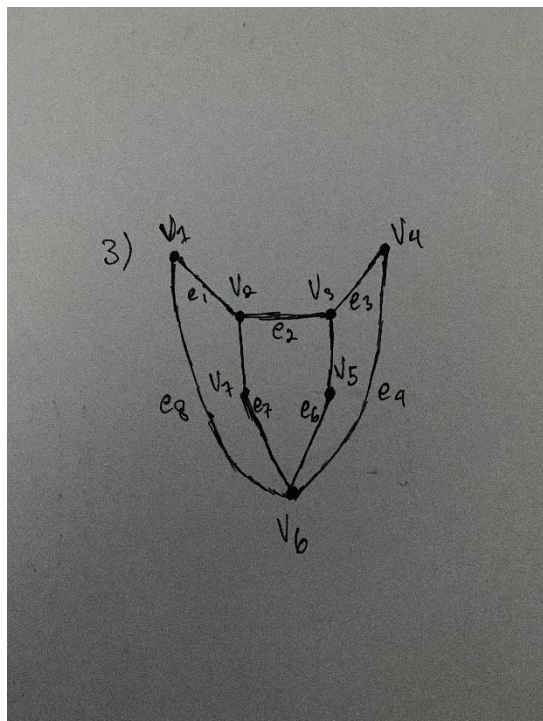
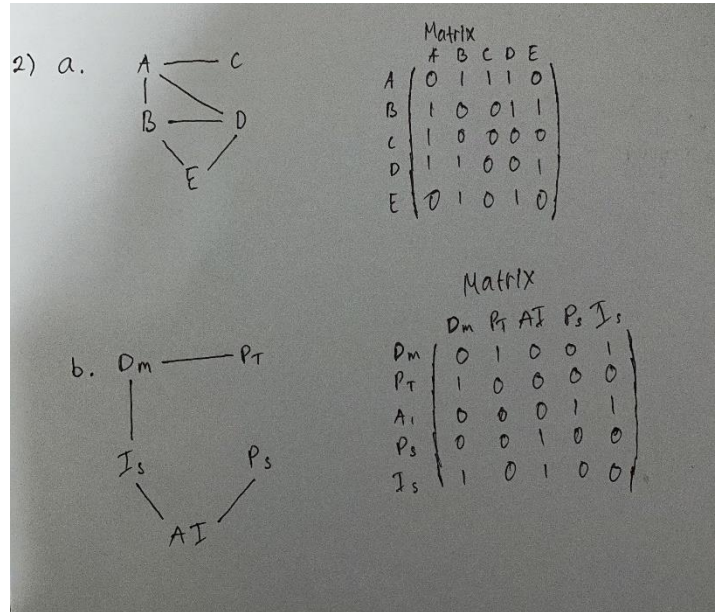
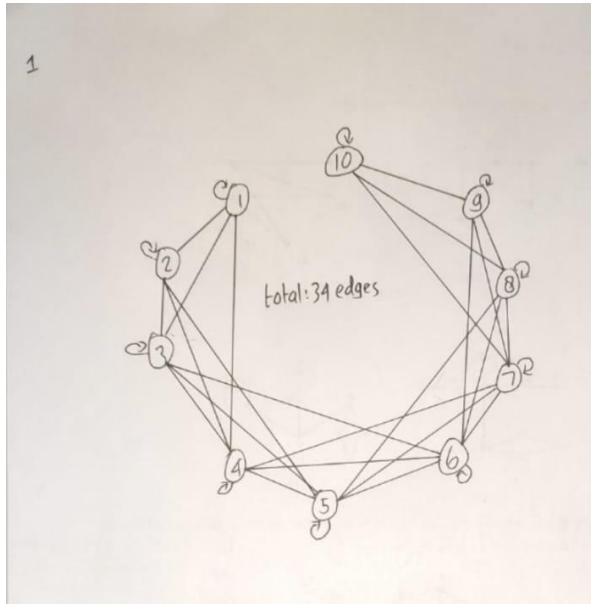


## Assignment 4 SECI1013-08

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5) a. Both have 5 vertices and 5 edges,  
are connected and simple graph,  
and have 1 vertex with one degree,  
1 vertex with three degree, and  
three vertices with two degree.

hence  $G_1$  and  $G_2$  are isomorphic

b. NOT ISOMORPHIC!

because in  $\deg(G_2) = 5$ , there is  
no vertex in  $H_2$  that has  
degree 5

6) a. trail

b. walk

c. closed walk

d. simple cycle

e. closed walk

f. path

7) a. 3

b. 9

c. 27

8. A. Vertex  $V_1, V_2, V_3, V_4, V_5$   
degree 2 4 2 4 4

graph a is a euler circuit because the degrees are all even.

ex  $(V_1, e_2, V_2, e_1, V_3, e_3, V_4, e_4, V_5,$   
 $e_5, V_4, e_6, V_3, e_7, V_2, e_8, V_1)$

B. Vertex  $V_1, V_2, V_3, V_4, V_5, V_6, V_7, V_8, V_9, V_{10}$   
degree 5 2 2 2 4 2 2 3 3 2

graph b has no euler circuit because there are 3 odd number of degree.

9. A. Vertex  $V_0, V_1, V_2, V_3, V_4, V_5, V_6, V_7, u, w$   
degree 2 2 4 2 4 2 4 2 3 3

has Euler path from  $u$  to  $w$ . ✓

$(u, V_1, V_0, V_7, u, V_2, V_3, V_4, V_7, V_6, V_4, w, V_6, V_5, w)$

B. Vertex  $a, b, c, d, e, f, g, h, u, w$   
degree 2 2 2 2 3 4 2 3 3 3

has no euler path

10. both don't have Hamiltonian circuit, there are only Hamiltonian circuit.  
 because for (a) must pass (u-v) edge twice to fulfill the law, while  
 for (b) must pass (u-f) twice to fulfill the law

$$\begin{aligned}
 11. \quad L &= \frac{(m-1)n+1}{m} \\
 &= \frac{(3-1)100+1}{3} \\
 &= \frac{200+1}{3} \\
 &= \frac{201}{3} = 67
 \end{aligned}$$

- 12) a. Root  $\rightarrow a$   
 b. Internal vertices  $\rightarrow a, b, d, e, g, h, j$   
 c. Leaves  $\rightarrow k, l, m, f, r, s, c, o, i, p, q$   
 d. Children of n  $\rightarrow r, s$   
 e. Parent of e  $\rightarrow b$   
 f. Siblings of k  $\rightarrow l, m$   
 g. Proper ancestors of q  $\rightarrow a, d, j$   
 h. Proper descendants of b  $\rightarrow e, f, g, k, l, m, n, r, s$

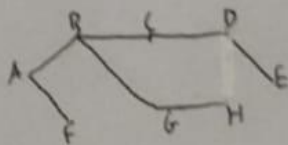
13) Pre Order  $\rightarrow$  a, b, e, k, l, m, f, g, n, r, s, c, d, h, o, i, j, p, a

Inorder  $\rightarrow$  k, l, e, m, b, f, r, n, s, g, a, c, o, h, i, d, p, j, a

Postorder  $\rightarrow$  k, l, m, e, f, r, s, n, g, b, c, o, h, i, p, a, j, d, a

14. AB 1  
GH 1  
BC 2  
AF 3  
BF 4  
CD 4  
BG 5  
DH 6  
GD 7  
DE 7  
FG 8  
HE 9

Minimum = AB, GH, BC, AF, CD, BG, DE



total weight = 23

| 15 | Iteration | S       | N        | L(C) | L(P)     | L(N)     | L(S)     | L(R)     | L(O)     | L(T)     | L(A)     |
|----|-----------|---------|----------|------|----------|----------|----------|----------|----------|----------|----------|
| 0  |           | {}      | MPASNEOT | 0    | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ | $\infty$ |
| 1  |           | {M}     | PSNEOT   | 0    | 2        | 4        | $\infty$ | 5        | $\infty$ | $\infty$ | $\infty$ |
| 2  |           | {MP}    | ASNEOT   | 0    | 2        | 4        | 5        | 5        | 10       | $\infty$ | 6        |
| 3  |           | {MPN}   | KSROT    | 0    | 2        | 4        | 5        | 5        | 10       | $\infty$ | 6        |
| 4  |           | {MPNS}  | ART      | 2    | 3        | 4        | 5        | 5        | 10       | 6        | 6        |
| 5  |           | {MPNSR} | XT       | 2    | 3        | 4        | 5        | 5        | 10       | 6        | 6        |

shortest path is (MPNSRT)

