No.: Date:

Q1

1) a) Total = 20 + 5 = 25

ways to select all teachers = 5C4
= 5

ways to form 4 people in group = 25C4
= 12650

probability = $\frac{5}{12650} = \frac{1}{2530}$ = 0.0003953

b) ways to select 2 teachers = 5C2
= 10

ways to select 2 parents = 20C2
= 190

probability = $\frac{10 \times 190}{12650} = \frac{38}{253}$ = 0.1502

2) Let A∩B = Kamal will live on campus and buy a new car = 0.37

Let B = Kamal will live on campus = 0.73

$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{0.37}{0.73}$ = 0.5068

3) a) E = {(1,1), (1,3), (1,5), (3,1), (3,3), (3,5), (5,1), (5,3), (5,5), (2,2), (2,4), (2,6), (4,2), (4,4), (4,6), (6,2), (6,4), (6,6)}

b) probability that sum = 9 : {(3,6), (4,5), (5,4), (6,3)} = 4

probability of all posible outcome : 6 × 6 = 36

probability = $\frac{4}{36} = \frac{1}{9}$ = 0.1111

c) probability that sum = 7 : {(1,6), (6,1), (2,5), (5,2), (3,4), (4,3)} = 6

probability that sum = 8 : {(2,6), (6,2), (3,5), (5,3), (4,4)} = 5

probability = $\frac{5+6}{36}$ = 0.3056

No.: Date:

Q2

a) P(A) = The computer was purchased from Acme = $\frac{55}{100}$ = 0.55

P(D) = The computer was purchased from Datcom = $\frac{10}{100}$ = 0.10

P(N) = The computer was purchased from Nuclear = $\frac{35}{100}$ = 0.35

b) P(B) = The computer was defective

$P(B|A) = \frac{1}{100} = 0.01$

$P(B|D) = \frac{3}{100} = 0.03$

$P(B|N) = \frac{3}{100} = 0.03$

$P(B) = (0.55)(0.01) + (0.10)(0.03) + (0.35)(0.03)$

$= 0.019$

2 a) Let I = Event of Covid-19 active infection

Let T = Event of positive RT-PCR test

P(I) = 0.15

P(T|I) = 0.95

P(T|I') = 0.02

P(I') = 1 − 0.15 = 0.85

$P(I|T) = \frac{P(T|I)P(I)}{P(T)}$

$P(T) = P(T|I)P(I) + P(T|I')P(I')$

$= (0.95)(0.15) + (0.02)(0.85)$

$= 0.1595$

$P(I|T) = \frac{(0.95)(0.15)}{0.1595} = 0.8934$

b) $P(I'|T) = \frac{P(T|I')P(I')}{P(T)}$

$= \frac{(0.02)(0.85)}{0.1595}$

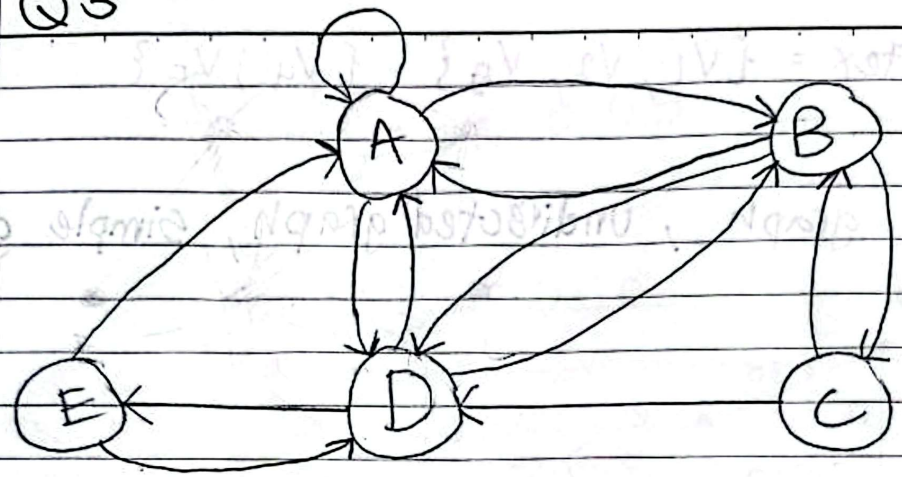
$= 0.1066$

NO. DATE:

Q3

1.

d)



b)

	A	B	C	D	E
In-degree	4	3	1	4	1
out-degree	3	3	2	3	2
total degree	7	6	3	7	3

2)

a) Vertex: is a point where two or more line segment meet. The objects that are drawn as dots.

b) Edge: one of the connections between the vertices

c) Loop: is an edge that connects a vertex to itself

d) Parallel edges: is two or more edges that are incident to the same two vertices.

e) Degree of the vertex: is the number of edges that are incident to the vertex.

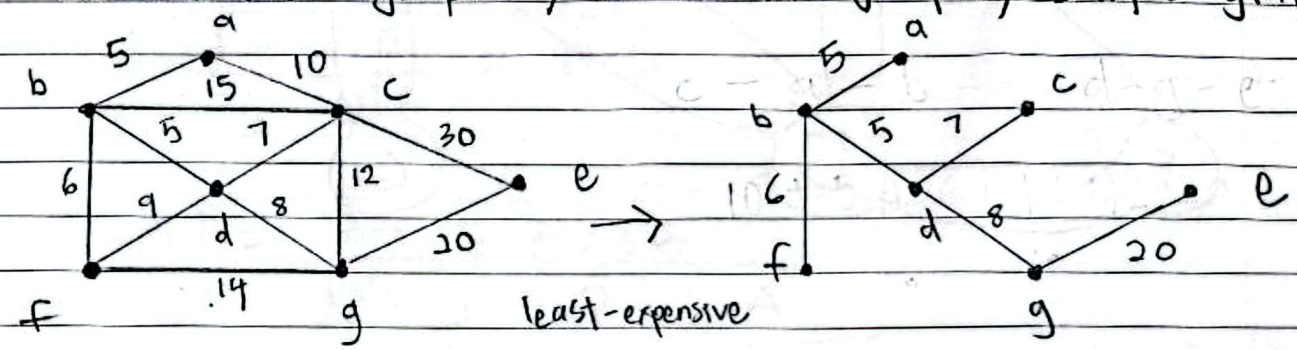
NO: DATE:

Q4

1. a. disjoint vertex = $\{V_1, V_2, V_5\}, \{V_3, V_4\}$

b. connected graph, undirected graph, simple graph

2.



least expensive = 5+5+6+7+8+20
= 51

Q5

1. Graph G1 and G2 have the same number of vertice and edges. Beside that, graph G1 and G2 have same number of degree for corresponding vertices.

A_{G1} =

	a	b	c	d	e	f	g
a	0	1	0	0	0	0	1
b	1	0	1	0	0	0	0
c	0	1	0	1	0	0	0
d	0	0	1	0	1	0	0
e	0	0	0	1	0	1	0
f	0	0	0	0	1	0	1
g	1	0	0	0	0	1	0

Q5

1)		G_1	G_2		
	vertices	7	7	$f(a_{G_1}) = 1_{G_2}$	$f(e_{G_1}) = 2_{G_2}$
	edges	7	7	$f(b_{G_1}) = 3_{G_2}$	$f(f_{G_1}) = 4_{G_2}$
	vertices with 2 degree	7	7	$f(c_{G_1}) = 5_{G_2}$	$f(g_{G_1}) = 6_{G_2}$
				$f(d_{G_1}) = 7_{G_2}$	

$A_{G1} = A_{G2}$

∴ So they are isomorphic

A_{G2} =

	1	3	5	7	2	4	6
1	0	1	0	0	0	0	1
3	1	0	1	0	0	0	0
5	0	1	0	1	0	0	0
7	0	0	1	0	1	0	0
2	0	0	0	1	0	1	0
4	0	0	0	0	1	0	1
6	1	0	0	0	0	1	0

No.: ..... Date: .....

2) a)

	G_1	G_2
vertices	6	6
edges	9	9
vertices with 3 degree	6	6

$f(a_{G_1}) = 1_{G_2}$ $f(e_{G_1}) = 5_{G_2}$

$f(b_{G_1}) = 2_{G_2}$ $f(f_{G_1}) = 6_{G_2}$

$f(c_{G_1}) = 3_{G_2}$

$f(d_{G_1}) = 4_{G_2}$

	a	b	c	d	e	f
a	0	1	1	0	1	0
b	1	0	1	0	0	1
c	1	1	0	1	0	0
d	0	0	1	0	1	1
e	1	0	0	1	0	1
f	0	1	0	1	1	0

adjacent matrix G_1

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

adjacent matrix G_2

However, adjacent matrix of G_1 are not equal to G_2.
$f: G_1 \rightarrow G_2$ cannot be defined
it is not isomorphic

G_1 also has a simple cycle of length 3 but G_2 does not have. For example  a − b − c − a

b)

	G_1	G_2
vertices	6	6
edges	11	11
vertices with 3 degree	2	2
vertices with 4 degree	4	4

$f(a_{G_1}) = 1_{G_2}$ $f(e_{G_1}) = 5_{G_2}$

$f(b_{G_1}) = 2_{G_2}$ $f(f_{G_1}) = 6_{G_2}$

$f(c_{G_1}) = 3_{G_2}$

$f(d_{G_1}) = 4_{G_2}$

	a	b	c	d	e	f
a	0	1	1	1	1	0
b	1	0	1	0	1	1
c	1	1	0	0	0	1
d	1	0	0	0	1	1
e	1	1	0	1	0	1
f	0	1	1	1	1	0

adjacent matrix G_1

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

adjacent matrix G_2

The degree of vertex a in G_1 has 4 degree but degree of vertex 1 in G_2 has only 3 degree.
However, adjacent matrix of G_1 are not equal to G_2
$f: G_1 \rightarrow G_2$ cannot be defined
It is not isomorphic

3)