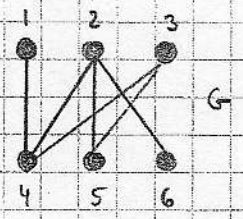
MAAA26 Assignment 9

① (a)



(b) Two simple graphs G and are isomorphic if there is a bijective function f mapping the vertices of G to the vertices of H in such a way that if xy is an edge of G then $f(x)f(y)$ is an edge of H.

(c) No, G and H are not isomorphic as H contains a 3-cycle $cdfc$ while G is bipartite, so G has no odd cycle.

(d) The adjacency matrix of H_1 is

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

An adjacency matrix of H_2 is

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

so f defined by

x	a	b	c	d	e	f
$f(x)$	4	5	6	1	2	3

is an isomorphism between H_1 and H_2.

②

Edge chosen	weight
ae	1
if	1
ei	1
eh	1
ed	1
eb	1
ec	1
xa	2
hg	2
fy	4
	15 ← total weight of the MST

Note the MST in exercise 8 is not unique, but all MSTs have weight 15.