

### Tutorial Sheet 14 (Answers)

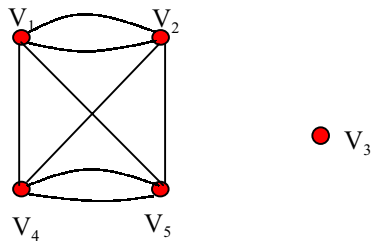
1 (a)

$$\begin{pmatrix} 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 1 & 3 & 0 \\ 0 & 1 & 0 & 1 & 0 \\ 0 & 3 & 1 & 0 & 1 \\ 1 & 0 & 0 & 1 & 0 \end{pmatrix}$$

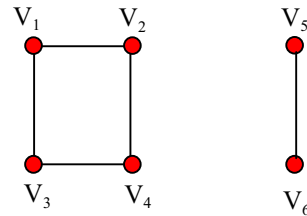
(b)

$$\begin{pmatrix} 0 & 1 & 0 & 0 & 1 \\ 1 & 0 & 0 & 2 & 1 \\ 0 & 0 & 0 & 0 & 0 \\ 0 & 2 & 0 & 0 & 1 \\ 1 & 1 & 0 & 1 & 0 \end{pmatrix}$$

2. (a)



(b)



3.

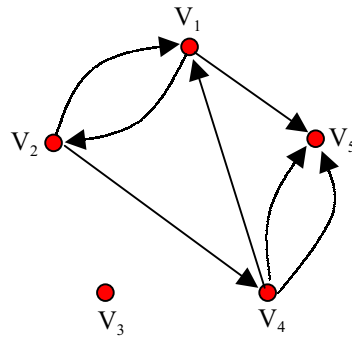
	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$
$v_1$	1	0	0	0	1	0	0	0
$v_2$	1	1	0	0	0	1	1	1
$v_3$	0	1	1	0	0	0	0	0
$v_4$	0	0	0	1	0	1	1	1
$v_5$	0	0	0	1	1	0	0	0

	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$
$v_1$	1	0	0	1	0	0
$v_2$	1	1	0	0	1	1
$v_3$	0	0	0	0	0	0
$v_4$	0	1	1	0	0	1
$v_5$	0	0	1	1	1	0

4.

	$v_1$	$v_2$	$v_3$	$v_4$	$v_5$
$v_1$	0	0	0	0	1
$v_2$	0	0	0	0	1
$v_3$	1	0	0	0	1
$v_4$	1	1	0	0	0
$v_5$	1	0	0	1	0

5.



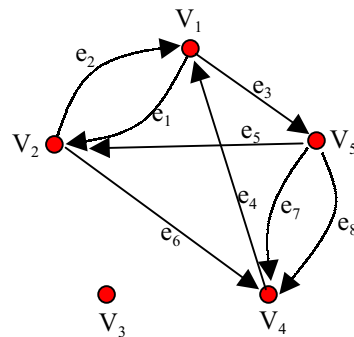
6.(a)

	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$
$v_1$	+1	0	0	0	0
$v_2$	-1	+1	+1	0	0
$v_3$	0	-1	0	+1	-1
$v_4$	0	0	-1	-1	+1

(b)

	$e_1$	$e_2$	$e_3$	$e_4$	$e_5$	$e_6$	$e_7$	$e_8$
$v_1$	+1	0	0	0	-1	0	0	0
$v_2$	-1	+1	0	0	0	+1	-1	-1
$v_3$	0	-1	0	0	0	0	0	0
$v_4$	0	0	+1	-1	0	-1	+1	+1
$v_5$	0	0	-1	+1	+1	0	0	0

7.



- 8 (a) connected
- (b) disconnected