6(a)	series charges: $Q_S = Q_1 = Q_2$
	series p.d.s: $V_S = V_1 + V_2$
	parallel charges: $Q_S = Q_1 + Q_2$
	parallel p.d.s: $V_S = V_1 = V_2$
6(b)(i)	$E = ½ CV^2$
	p.d. $= [(2 \times 19 \times 10^{-3}) / (470 \times 10^{-6})]^{½}$ $= 9.0$ V
6(b)(ii)	$E = Q^2 / 2C$ **or** $C = Q / V$
	$Q = (19 \times 10^{-3} \times 2 \times 470 \times 10^{-6})^{½}$ **or** $Q = 470 \times 10^{-6} \times 9.0$ $Q = 4.2 \times 10^{-3}$ C
6(b)(iii)	total charge unchanged
	total capacitance $= (470 + 180) \times 10^{-6}$ (F)
	$E = Q^2 / 2C = (4.23 \times 10^{-3})^2 / (2 \times 650 \times 10^{-6})$ (= 0.014 J) $E = 14$ mJ

6(a)(i)	conversion of a.c. to d.c.
6(a)(ii)	full-wave (rectification)
6(a)(iii)	three diodes with correct symbols connected into the circuit
	lower-left diode shown pointing towards the right **and** upper-left and lower-right diodes both shown pointing towards the left
6(b)(i)	$\omega = 18$ (rad s^{-1})
	$T = 2\pi / 18 = 0.35$ s
6(b)(ii)	$V_{r.m.s.} = 34 / \sqrt{2}$ $= 24$ V
6(b)(iii)	sinusoidal 'humps' with minimum $V_{OUT} = 0$ and non-zero V_{OUT} all same sign
	peak V_{OUT} shown as 34 V **or** –34 V
	two 'humps' shown, with V_{OUT} always with same sign **and** $V_{OUT} = 0$ at $t = 0$, $t = 0.175$ s and $t = 0.350$ s **and** non-zero in between
6(c)(i)	correct circuit symbol for capacitor, connected in parallel with resistor
6(c)(ii)	time constant $= RC$
	$= 56 \times 10^3 \times 12 \times 10^{-6}$ $= 0.67$ s
6(c)(iii)	$V_{min} = 34 \exp(-0.14 / 0.67)$
	$= 28$ V

7(a)	$V_C = V_R$
7(b)(i)	$C = Q / V$
	$= (7.2 \times 10^{-3}) / 12$ $(= 6.0 \times 10^{-4}$ F) $= 600\ \mu$F
7(b)(ii)	$R = V / I$
	$= 12 / (1.5 \times 10^{-3})$ $(= 8000\ \Omega)$ $= 8.0$ kΩ
7(b)(iii)	$\tau = RC$
	$= 8000 \times 6.0 \times 10^{-4}$ $= 4.8$ s
7(c)	*Any two points from:* • charge and current are both (directly) proportional to voltage • charge is (directly) proportional to current • current is the rate of change of charge
	Q is proportional to the rate of change of Q (so exponential variation)