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

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5(a)	$Q = Q_1 = Q_2$ <u>and</u> $V = V_1 + V_2$
	$V = Q / C$ so: $Q / C = Q / C_1 + Q / C_2$ <u>leading to</u> $1 / C = 1 / C_1 + 1 / C_2$
5(b)	total capacitance = $C + ½C = (3 / 2)C$
	total capacitance = gradient $= 400 \times 10^{-6} / 6.0$
	either: $C = (2 \times 400 \times 10^{-6}) / (3 \times 6.0) = 4.4 \times 10^{-5}$ F = 44 μF *or*: $C = (2 \times 400) / (3 \times 6.0) = 44$ μF
5(c)(i)	$\tau = RC$
	$= 54 \times 10^3 \times (3/2) \times 44 \times 10^{-6}$ $= 3.6$ s
5(c)(ii)	$0.15 = \exp(-t / 3.6)$
	$t = 6.8$ s