Question Number	Answer		Mark
14a	Use of $I = V / R$	(1)	**2**
	I = 0.15 mA which is consistent (with the value on the graph)	(1)	
	Example of calculation I = 5.0 V / 33 kΩ = 1.5 ×10^{-4} A = 0.15 mA		
14b	The current would vary with time in the same way as on ammeter A_1	(1)	**2**
	Because (current is same everywhere) in a series circuit	(1)	
14c	**Either** Takes two corresponding values of I and t from graph	(1)	**3**
	Use of $\ln I = \ln I_0 - t/RC$	(1)	
	C = 2.27 ×10^{-4} F (2.0 ×10^{-4} F - 2.3 ×10^{-4} F)	(1)	
	Or		
	Draws initial tangent to curve and determines t intercept: T (0.65-0.75 s)	(1)	
	Use of $T = RC$	(1)	
	C = 2.2 ×10^{-4} F (2.0 ×10^{-4} F - 2.3 ×10^{-4} F)	(1)	
	Or		
	Read value of t at which $I = I_o / e$ (0.56 A, 0.7 s)	(1)	
	Use of $T = RC$	(1)	
	C = 2.1 ×10^{-4} F (2.0 ×10^{-4} F - 2.3 ×10^{-4} F)	(1)	
	Example of calculation eg I = 0.04 mA and t = 10 s $\ln 0.04 = \ln 0.152 - \frac{10\text{s}}{C \times 33\text{k}}$ C = 2.27 ×10^{-4} F range: 2.0 ×10^{-4} F - 2.3 ×10^{-4} F		
14d	Attempt to determine an area under the curve	(1)	**2**
	Q = 1.1 ×10^{-3} C (1.0 ×10^{-3} C to 1.2 ×10^{-3} C)	(1)	
	Or Use of $Q = CV$ with 5.0 V	(1)	
	Q = 1.1 ×10^{-3} C (allow ecf from (c))	(1)	
14e	Use of $W = \frac{QV}{2}$ or $W = \frac{1}{2}CV^2$ or $W = Q^2/2C$	(1)	**2**
	W = 2.8 ×10^{-3} J (allow ecf from 14c and 14d)	(1)	
	Example of calculation W = 1.1 ×10^{-3} C × 5 V / 2 = 2.8 ×10^{-3} J		
	Total for question 14		**11**