

Question number	Answer	Notes	Marks
9 (a)	LED drawn on branch of circuit containing only R_1 ; LED drawn in the correct orientation;		2
(b) (i)	correct ammeter symbol drawn on main branch of circuit and in series with cell;		1
(ii)	voltage across R_2 is the same / 4.5 V; (because) they are in parallel;	allow higher level answers in terms of energy transferred per unit charge	2
(c) (i)	energy (transferred) = charge \times voltage;	allow standard symbols and rearrangements e.g. $Q = E / V$ reject C for charge	1
(ii)	substitution; rearrangement; evaluation; e.g. $4.1 = \text{charge} \times 4.5$ (charge =) $4.1 / 4.5$ (charge =) 0.91 (C)	allow 0.911...(C)	3
(iii)	idea that a voltmeter is needed; voltmeter should be connected across / in parallel (with R_2); suitable means of varying circuit current described;	e.g. changing number of cells, using a variable power supply, adding variable resistor to the circuit	3

Total for Question 9 = 12 marks