Name of the Student:_____
Max. Marks : 22 Marks **Time : 22 Minutes**

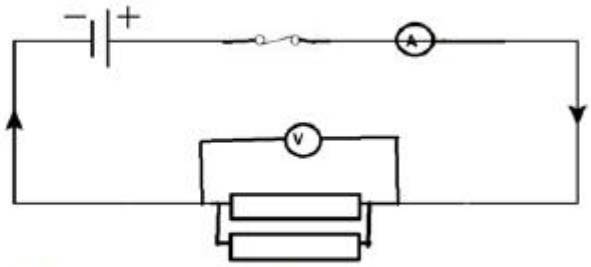
Mark Schemes

Q1.

Question Number	Answer	Mark
*	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. AO1(6 marks) Circuit diagram including • power supply • ammeter • voltmeter • filament lamp • means of varying potential difference Description of method • measure current with ammeter • measure potential difference with voltmeter • vary the potential difference • calculate the resistance • repeat and compare	**(6)** AO 1 2

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• An explanation that demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific, enquiry, techniques and procedures lacks detail. (AO1) • Presents an explanation that is not logically ordered and with significant gaps. (AO1)
Level 2	3-4	• An explanation that demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas, enquiry, techniques and procedures is not fully detailed and/or developed. (AO1) • Presents an explanation of the procedure that has a structure, which is mostly clear, coherent and logical with minor steps missing. (AO1)
Level 3	5-6	• An explanation that demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas, enquiry, techniques and procedures is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure, which is clear, coherent and logical. (AO1)

Q2.

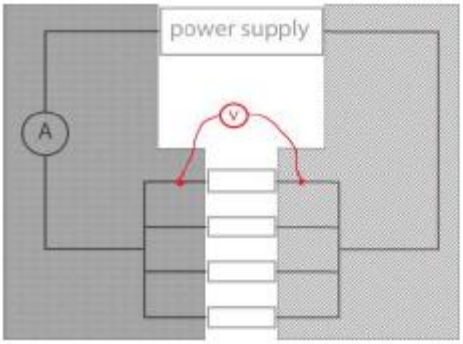
Question number	Answer	Additional guidance	Mark
(i)	 voltmeter in parallel across resistor (1) second resistor in parallel (1)		(2)

Question number	Answer	Additional guidance	Mark
(ii)	potential difference/ voltage (drop across resistors in parallel) (1) current (in the circuit) (1)	voltmeter reading ammeter reading	(2)

Question number	Answer	Additional guidance	Mark
(iii)	1 Ω	one ohm	(1)

Question number	Answer	Additional guidance	Mark
(iv)	Comments to include: the (overall) resistance decreases as the number of resistors (in parallel) increases (1) the relationship is non-linear (1) any two relevant values from the graph (1)	 decreases at a decreasing rate the relationship is inversely proportional scores first 2 marks	(3)

Q3.

	Answer	Additional guidance	Mark
(i)	voltmeter in parallel with resistors (1)	 one voltmeter connection in each shaded region	(1) A)1.2

	Answer	Additional guidance	Mark
(ii)	36(.4) (mA) (1)	allow 36 to 37 inclusive may be seen in table in Figure 6	(1) AO3.2

	Answer	Additional guidance	Mark
(iii)	substitution into $V = IR$ (1) $6(.00) = 9.1 (\times 10^{-3}) \times R$	allow substitution and rearrangement in either order accept 18.2/2 or 27.3/3 or (36 to 37)/4 in place of 9.1 allow substitution of correct values into a	(3) AO2.1

	rearrangement (1) (R =) $\frac{6(.00)}{9.1 (\times 10^{-3})}$ evaluation (1) 660 (Ω)	visible, incorrectly rearranged algebraic equation for this mark only (R =) $\frac{V}{I}$ allow values that round to 660 e.g. 659.3 award full marks for the correct answer without working. value rounding to 660 to any other power of 10 scores 2 marks	

	Answer	**Additional guidance**	**Mark**
(iv)	an explanation linking: (total) resistance increases (1) (because) current decreases (1) (and) voltage stays the same (1)	 fewer paths for the current resistance calculations supporting increasing resistance	**(3)** **AO3.2**