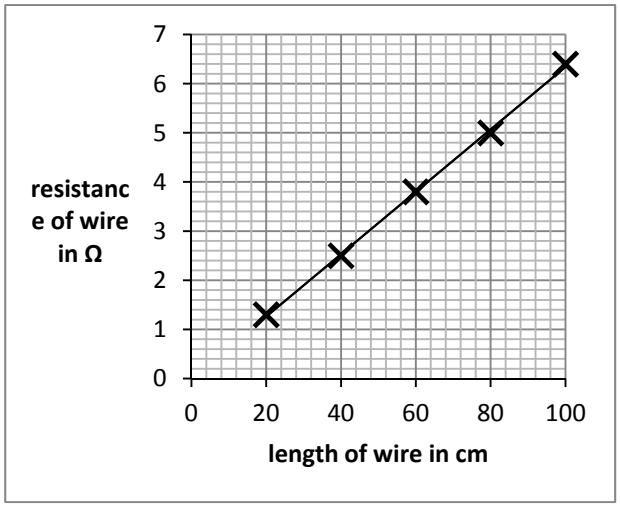
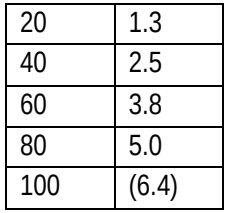
Question number	Answer	Notes	Marks
1 (a) (i)	C - 14		1
(ii)	B - 8		1
(iii)	A - 6		1
(b)	A - An electron		1
(c)	A - 1.5 g		1
(d)	Atoms/nuclei with same number of protons / same atomic number / same element; Different numbers of neutrons / different mass number / different atomic mass;	ALLOW ‘different mass’ for second mark if it’s clear they are comparing atoms within the same element rather than different elements IGNORE references to electrons if possible, but if candidates makes an incorrect reference to electrons then list principle applies for that mark (e.g ’same number of protons but different number of neutrons and electrons’ = 1)	1 1
		Total	**7**

Question Number	Answer	Notes	Marks
3 (d) (i)	Sample graph –  scale; at least half the paper axes labelled including units; Plotting; Plotting; Best fit line;	 Points to plot IF AXES REVERSED, LOSE THE AXES MARK Ignore (100 cm, 6.4) ALLOW as length increases resistance increases ALLOW conclusions in terms of resistance per metre etc	5

Question number	Answer	Notes	Marks
4 (a)	(speed = 2πr/T is given) use of equation; final value; matching unit; e.g: Speed = (2 x π x 58 000 000) / (88 x 24 x 60 x 60) Speed = (2 x π x 58 000 000) / (88 x 24 x 60 x 60) = 47.9 km/s	alternatives - 88 days, 2112 hours, 126720 minutes, 7603200 seconds 47930 m/s, 172439596 m/hr, 172548.596 km/hr, 4138560 km/day	3
(b) (i)	Gravitational;	ALLOW 'gravity'	1
(ii)	Ellipse added to diagram with Sun nearer one focus of the ellipse;	DO NOT ALLOW symmetrical ellipse with Sun at the centre ALLOW incomplete ellipse (i.e. path around the Sun shown with orbit extending beyond the diagram space)	1
(iii)	Point closest Sun labelled X / ecf from the ellipse drawn	Should ideally extend from outside Mercury orbit to inside Mercury orbit ALLOW a tolerance on the position of X in line with the drawing skill	1
(iv)	Close / closest / closer to Sun; Gravitational force strongest;	ALLOW '(force of) gravity greater' ALLOW Answer based on gpe/ke	1 1
		Total	**8**