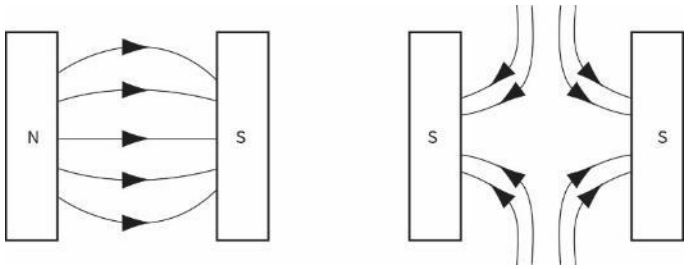
KS3 Physics

Answers

Chapter 5 – Electricity and magnetism

Question	Answers	Extra information	Mark
1(a)	Two positive charges will – repel. A positive and a negative charge will – attract. Electrons have – a negative charge. Neutral means – no charge.	3 marks for 3 or 4 correctly matched 2 marks for two correctly matched 1 mark for one correctly matched	3
(b)	the region where a force acts on a charge		1
2(a)	From left to right: ammeter cell voltmeter motor lamp		 1 1 1 1 1
(b)	A, B, D	All three needed for the mark	1
(c)	C		1
(d)	3 V		1
3(a)	nickel, iron	Both needed for the mark	1
(b)	compass/iron filings		1
(c)			2

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4(a)	2 A 6 Ω		1 1 1
(b)	low plastic do not		1 1 1
5(a)	the rod and cloth were neutral at the start		1
(b)	the negative charge is produced when electrons are transferred when electrons are transferred, it leaves a (residual) positive charge		1 1
(c)	they will repel they have the same charge		1 1
6(a)	do not have the current on very long/be careful not to let the wire get hot/do not touch the wire as it may be hot		1
(b)	number of turns		1
(c)	number of paperclips picked up		1
(d)	same nail/same battery/same length of wire		1
(e)	the number of turns is a discrete variable		1
7(a)	you can turn them on and off		1
(b)	when the window opens, a current no longer flows in circuit 1 the electromagnet stops working and the metal piece falls the metal piece completes circuit 2 the bell rings because the circuit is complete		1 1 1 1
8(a)	top circle: V bottom circle: A		1

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(b)	$R = \frac{V}{I}$ $= \frac{10\text{ V}}{0.5\text{ A}}$ $= 20\ \Omega$	Both 20 and Ω needed for the mark	1 1 1
(c)	$R = \frac{V}{I}$ $IR = \frac{VI}{I}$ $\frac{IR}{R} = \frac{V}{R}$ so $I = \frac{V}{R}$		1 1 1
(d)	if the resistance increases, the current decreases resistance is on the bottom of the fraction/if you divide by a bigger number you get a smaller number		1 1
(e)	if the wire is longer, there are more atoms/they make it harder for electrons to move through the wire so the electrons move more slowly/the current is smaller and resistance larger		1 1
9(a)	$I = 0.004$ A $R = \frac{V}{I}$ $= \frac{8\text{ V}}{0.004\text{ A}}$ $= 2000\ \Omega$	Both 2000 and Ω needed for the mark	1 1 1 1
(b)	if the current is halved, the resistance must be doubled so resistance = 4000 Ω		1 1

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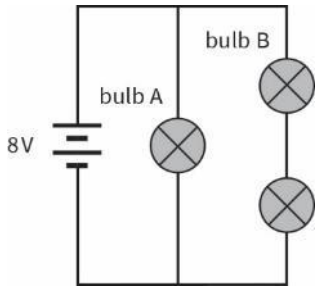
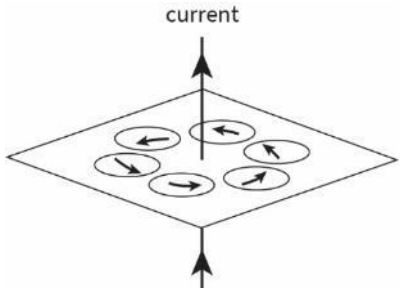
(c)i		1 mark for two loops 1 mark for both connected to the battery	1 1
(c)ii	8 V		1
(d)	2 mA + 4 mA = 6 mA OR 0.002 A + 0.004 A = 0.006 A		1 1
(e)	the current in the battery is bigger than the current in either bulb so the resistance of the circuit is smaller than the resistance of either bulb		1 1
10(a)			1
(b)	it gets smaller		1
	SPACED LEARNING QUESTIONS		
11(a)	month		1

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(b)	gravity		1
12(a)	The different frequencies (colours) of light are refracted in different amounts so the colours are spread out		1 1
(b)	in A and B, blue light is reflected, but in C, no light is reflected in A and C, light is absorbed, but in B, it is only reflected		1 1
(c)	blue light has a larger frequency than red light		1

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