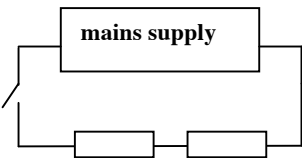
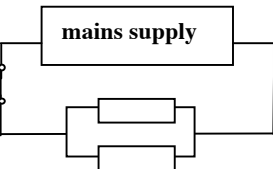


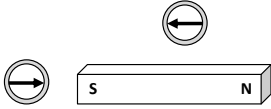
Assessment Schedule – 2013

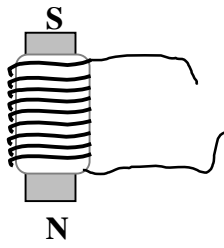
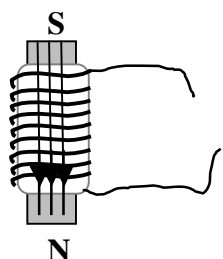
Physics: Demonstrate understanding of aspects of electricity and magnetism (90937)

Evidence Statement

Significant figures are not required and correct units are required only in the questions that specifically ask for them.

Question	Achievement	Merit	Excellence					
ONE (a)	Correct wiring. Correct symbols. 							
(b)	Resistors are in series , so the same current flows through the resistors.	Resistors are in series and the same current flows through the resistors because there is only one pathway for the current to flow / current must flow through both resistors .						
(c)	Total resistance is calculated or any one step is correct.	Current is calculated correctly.	$R_T = 50 + 40 = 90 \Omega$ $I = \frac{V}{R} = \frac{240}{90} = 2.67 \text{ A}$ $P = VI = 240 \times 2.67 = 640 \text{ W}$					
(d)	Correct wiring. 							
(e)	Describes that power consumption is higher. OR Calculates current through one coil. OR States that in parallel both resistors have 240V across then but voltage is shared in series.	Describes that power consumption is higher because the coils are in parallel and V or I is higher. OR Calculates current through both coils. OR <ul style="list-style-type: none"> Power consumption is higher than one in (c) $I = \frac{V}{R} = \frac{240}{40} = 6.0 \text{ A}$ <ul style="list-style-type: none"> $I = \frac{V}{R} = \frac{240}{50} = 4.8 \text{ A}$ $P = VI = 240 \times 10.8 = 2592 \text{ watts}$	<ul style="list-style-type: none"> Power consumption is higher than one in (c) Since the coils are connected in parallel, the voltage across each coil is 240 V. Current through each coil/total current is higher than if they were connected in series. Since $P = VI$, higher voltage and current will result in more power consumption. (Accept any answers that link higher current and higher voltage to power with reasons.) 					
NØ	N1	N2	A3	A4	M5	M6	E7	E8
No evidence	1a	2a OR 1m	3a OR 1a + 1m	4a	2m	3m	1m + 1e	2e

Question	Achievement	Merit	Excellence					
TWO (a)(i) (ii)	Either (i) or (ii) is correct.	(i) Magnetic field is the area / region where magnetic force is felt. AND (ii) 						
(b)	Iron is a magnetic material <u>and</u> the pencil lead is not.	When a magnet is brought near the iron nail, it gets magnetised and attracted to the magnet. (No description of induced polarity is required.)						
(c)	The soft iron becomes a magnet / the magnet attracts the soft iron.	Any TWO statements conveying TWO ideas. OR The force of attraction is stronger when the magnet is closer to the soft iron because the field is stronger / field lines are closer.	<ul style="list-style-type: none"> When the door approaches the soft iron, magnetic induction causes it to become a magnet / magnetised. The edge of the soft iron near the magnet becomes a south pole. (May be in diagram.) Because opposite poles attract, the door becomes firmly held against the frame. 					
(d)	Response mentions the idea of repulsion.	Partial descriptions for the tests are given. OR Recognises that only a magnet will repel a magnet and iron will attract, but fails describe a test.	Describes the following tests: <ul style="list-style-type: none"> Bring one end of the magnet near to one end of the bar. If the bar is repelled, then it is a magnet. If it attracts, then bring the other end near the same pole of the magnet. If it repels, it is a magnet. If it still attracts, then it is not a magnet. 					
NØ	N1	N2	A3	A4	M5	M6	E7	E8
No evidence	1a	2a OR 1m	3a OR 1a + 1m	4a	2m	3m	1m+1e	2e

Question	Achievement	Merit	Excellence					
THREE (a)	 <p>Poles are correctly labelled.</p>							
(b)	<p>Either correct shape or correct field direction.</p>	 <p>Correct shape and field direction (at least TWO approx. parallel lines from S to N – consistent with students polarity.)</p>						
(c)	<p>Calculated the current correctly. OR B calculated for incorrect current.</p>	<p>Calculated B using d as 15 cm and obtained an answer of 8.0×10^{-8} T OR correct working with one mistake.</p>	$I = \frac{V}{R} = \frac{150}{25} = 6.0 \text{ A}$ $B = k \frac{I}{d}$ $= 2.0 \times 10^{-7} \times \frac{6.0}{0.15}$ $= 8.0 \times 10^{-6} \text{ T}$ <p>(unit not required)</p>					
(d)	<p>The variable resistor controls the current in the circuit / controls the strength of the electromagnet / polarity of the magnet changes / current still flows and creates a magnetic field.</p>	<p>Either (i) or (ii) is given or brief explanation of the ideas in (i) and (ii) are given.</p>	<p>(i) The variable resistor is used to control the current in the circuit, which in turn controls the strength of the electromagnet.</p> <p>(ii) If the polarity of the power supply were reversed, then TWO of:</p> <ul style="list-style-type: none"> • The current direction is reversed. • The poles of the electromagnet are also reversed. • The electromagnet is still magnetised and attract iron. 					
NØ	N1	N2	A3	A4	M5	M6	E7	E8
No evidence	1a	2a OR 1m	3a OR 1a+1m	4a	2m	3m	1m+1e	2e

Question	Achievement	Merit	Excellence					
FOUR (a)	Hair is positively charged.	Hair is positively charged because negative charges from the hair are transferred to the comb.						
(b)	Recognises need to use like charges repel / unlike charges attract	<ul style="list-style-type: none"> Bring each rod, one at time, near the charged tape to see which of them repels the tape. The tape carries the same charge as that on the rod, which repels the tape. OR <ul style="list-style-type: none"> Use one (stated) rod and attraction indicates opposite (stated) charge and repulsion indicates same (stated) charge 						
(c)	Recognises that the plant carries negative charges OR the spray carries positive charges.	Gives a good reason for the spread of droplets, eg: Explains that the negatively charged plant attracts the positively charged spray. Explains that positive droplets repel each other and this causes them spread out (even behind leaves) onto leaves. Indicates induced negative charge in leaves attracting positive droplets.						
(d)	Clothes become charged so they cling together. OR Clothes become oppositely charged.	Friction (rubbing) causes them to become charged. They become oppositely charged and opposite charges attract, so they cling together.	e7: Rubbing of clothes in the dryer causes electron transfer and the clothes acquire opposite charges due excess negative / positive charge. Since opposite charges attract, they cling together. (code e) e8: AND As clothes are insulators / are now dry, they do not quickly discharge. (code e e)					
NØ	N1	N2	A3	A4	M5	M6	E7	E8
No evidence	1a	2a OR 1m	3a OR 1a+1m	4a	2m	3m	1m+ e	1m+ e e

Judgement Statement

	Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
Score range	0 – 10	11 – 17	18 – 26	27 – 32