



L-Università  
ta' Malta

**MATSEC**  
Examinations Board



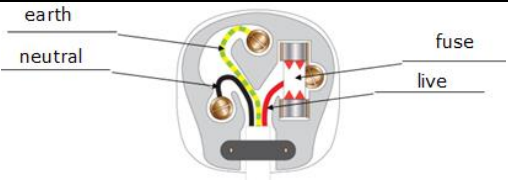
**Marking Scheme**  
SEC Physics

**Main Session 2019**

Marking schemes published by the MATSEC Examination Board are not intended to be standalone documents. They are an essential resource for markers who are subsequently monitored through a verification process to ensure consistent and accurate application of the marking scheme.

In the case of marking schemes that include model solutions or answers, it should be noted that these are not intended to be exhaustive. Variations and alternatives may also be acceptable. Examiners must consider all answers on their merits, and will have consulted with the MATSEC Examinations Board when in doubt.

## MARKING SCHEME: SEC PHYSICS (MAIN SESSION 2019)

PAPER 1					
Question	Answer	Mark	Guidelines		
1.	a	i	$a = \frac{v-u}{t}$ $a = \frac{2-0}{1.26} = 1.59 \text{ m/s}^2$ (accept the use of gradient)	2	1 mark for working 1 mark for answer & units
		ii	$F = ma$ $F = 0.03 \times 1.59$ $F = 0.048 \text{ N}$	1 1	Remove 1 mark if the mass is not converted into kg.
		iii	Height fallen = area under graph $= \frac{1}{2} b \times h$ $= \frac{1}{2} (1.26 \times 2) = 1.26 \text{ m}$	1 1	1 mark for working 1 mark for answer Allow the use of equations of motion to obtain the answer.
	b	i	The mass of the Moon is smaller than the mass of Earth	1	Do not accept 'bigger' if mass is not stated.
		ii	Unbalanced $F = ma$ Weight – Air resistance = $ma$ $0.3 - 0.27 = 0.03 a$ $a = 0.03 / 0.03 = 1 \text{ m/s}^2$	1 1 1	1 mark for weight 1 mark for method 1 mark for answer & unit
			<b>TOTAL</b>	<b>10</b>	
2.	a	i	Extension is directly proportional to load / stretching force provided elastic limit is not exceeded.	1 1	If the 1 <sup>st</sup> part is not correct, but the condition of elastic limit is correct, do not award any marks. Award full marks if candidates state that 'extension is proportional to mass' given that the elastic limit is not exceeded.
		ii	A pointer	1	
		iii	Pointer drawn horizontally below bottom of spring.	1	
		iv	A suitable precaution such as: - allowing spring to settle before taking readings; - read ruler perpendicularly.	1	
		v	stretching force/load (N) extension (mm/cm/m)	1 1	
	b	When mass = 0.20 kg, extension = 7.5 cm. When mass = 0.50 kg, extension = ? (18.75cm) New length = 18.75 + 5 = 23.75 cm	1 1 1	Accept methods using mass /or force.	
			<b>TOTAL</b>	<b>10</b>	
3	a		4	1 mark each	

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	b	i	$P = IV$ $I = 1270 / 230$ $I = 5.5 \text{ A}$	1 1	1 mark for method 1 mark for answer & units If an incorrect equation is used, but the 2 numbers are divided and the correct answer is not correct, do not award any marks as the method is not correct.	
		ii	$1270 \text{ W} = 1.270 \text{ kW}$ 30 minutes = 0.5 hours $1.27 * 0.5 = 0.635 \text{ kWh}$ $11 \text{ c} * 0.635 = 6.985 \text{ c} = 7 \text{ c}$	1 1 1	If the answer is of this format Eur 6.985c (having Eur and cents together), deduct 1 mark.	
	c	Metal case of appliance	1			
<b>TOTAL</b>				<b>10</b>		
4.	a	i	Particles are continuously bombarding the container walls.	1	Do not accept 'vibrating' without any reference to bombarding, collisions or hitting the walls.	
		ii	Pressure gauge reading decreases since particles have same energy but hit walls less frequently because of the increase in volume.	1 1	Reference to particle collisions is required.	
		iii	Pressure gauge reading increases since air particles have more energy/are moving faster and hit walls harder and more frequently.	1 1	Reference to particle collisions is required.	
	b	i	54 000 Pa	1		
		ii	P decreases with height, as there is less weight of air.	1 1		
		iii	There would be a pressure difference between inside and outside and if not air tight air would continuously leak from inside to outside.	1 1		
	<b>TOTAL</b>				<b>10</b>	
	5.	a	longitudinal waves	1		
		b	They consist of compressions and rarefactions in air. (or particles travelling parallel to the direction of travel of the wave)	1		
c		i		1 1 1 1	correct scale correct axes correct points marked size of graph more than 50% of graph paper Accept graphs that do not start from origin, if the other expected factors listed in the guidelines are correct.	

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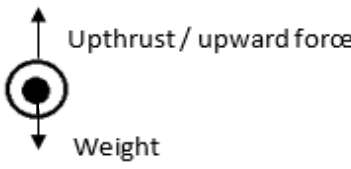
		ii	Speed of sound = gradient Gradient = $\frac{\Delta y}{\Delta x} = \text{_____ m/s}$  Allow for values close to 320 m/s as long as the points and working are correct.	1 1	1 mark for choosing to use gradient 1 mark for answer & unit Award marks only if gradient is used. No marks should be awarded if 1 coordinate is used in an equation of motion.	
		iii	Sound will take less time to travel. This is because sound travels faster in water.	1 1	Do not accept because water is denser.	
<b>TOTAL</b>				<b>10</b>		
6.	a		Isotopes are elements with the same number of protons (and/or atoms of the same element) but different mass number (or number of neutrons).	1 1		
		b	i	43	1	
			ii	99 - 43 = 56	1	
			iii	43	1	
		c		High Penetration Power or, low ionisation power or, has no charge or, EM wave.	1	Accept any other Gamma characteristic. Do not accept 'high frequency' or 'short wavelength', as long as they don't specify that it is an EM wave with those properties. High frequency or short wavelength is subjective, unless applied only to the EM spectrum.
		d		Sterilisation of equipment, kill cancer cells (chemotherapy), in industry to detect defects in metal castings, etc.	1	Accept any other Gamma use. Do not accept vague answers such as 'cancer' only, or MRI.
	e		So it stops being dangerous for patients after a short time.	1	Accept also 'so that it decays after a short time' without referring to the patients' safety.	
	f		Initial mass = 2 g After 6 hours = 1 g After 12 hours = 0.5 g After 18 hours = 0.25 g	1 1	Working Answer & Units	
<b>Total</b>				<b>10</b>		
7.	a	i	$m = \rho v$ $= 1000 \times (2.0 \times 10^{-3})$ $= 2.0 \text{ kg}$	1 1	1 working 1 answer & unit	
		ii	$2.04 - 2.00 = 0.04 \text{ kg}$	1		
		iii	$v = m / \rho$ $= 0.04 / 1380$ $= 2.9 \times 10^{-5} \text{ m}^3$ Total volume = $2.9 \times 10^{-5} \times 50\,000\,000 = 1449.3 \text{ m}^3$	1 1	1 answer & unit 1	

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		iv	Density increases.	1	No reason required. The question can be misunderstood, as the overall density of the waste increases, but the density of the plastic making it up will stay the same, no matter the shape. So, the full 1 mark is awarded, if candidates state clearly that 'since it is still plastic, the density will remain the same'. Do not accept 'it will remain the same' without any reason.
		b	larger than that in water	1	
		c	The temperature of water increases and the energy of particle increases and the most energetic particles evaporate (leave the surface).	1 1 1	
<b>TOTAL</b>				<b>10</b>	
8.	a		Electrical energy to heat energy	1	Award full marks only if both forms of energy are correct.
	b		Convection or convection currents	1	
	c		$Q = mc\Delta\theta$ $= 80 \times 4200 \times (60 - 20)$ $= 13\,440\,000 \text{ J}$	1 1	1 mark for working 1 mark for answer & unit
	d		$t = E/p$ $= 13\,440\,000/1500$ $= 8960 \text{ s}$	1 1	1 mark for working 1 mark for answer & unit
	e	i	heat absorbed by container (tank, etc.)	1	
		ii	heat transferred to surroundings (air)	1	
	f	i	Renewable form of energy; OR less pollution; OR energy saving.	1	Do not accept more efficient.
		ii	Black is a good absorber of heat.	1	
<b>TOTAL</b>				<b>10</b>	
9.	a	i	A system of planets in orbit round the sun, hence solar.	1	Accept 'celestial bodies orbiting the sun'. Reference to planets / celestial bodies is required. Do not accept 'because we orbit the sun'.
		ii	Pluto	1	
		iii	The distance covered by light in 1 year	1	
	b	i	Mars It takes more time to complete a longer orbit round the sun as the distance from the sun is longer than that of Earth.	1 1	
		ii	Earth Larger force of gravity per kg at surface.	1 1	Accept also 'gravity' instead of 'force of gravity' in this case.

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	c	Seasons	1	Do not accept answers that include both 'day/night' and 'seasons'. Only 'seasons' must be mentioned to award the full 1 mark.
	d	$\text{time} = \text{distance} / \text{speed}$ $= 2.25 \times 10^{11} / 3 \times 10^8$ $= 750 \text{ s}$	1 1	1 mark for working 1 mark for answer & unit
<b>TOTAL</b>			<b>10</b>	
10.	a	When a system is in equilibrium, the total clockwise moments about a pivot = total anticlockwise moments about same pivot.	1 1	
	b	i	1	
		ii	1 1	Answer should be in Nm to be correct. Ncm are not accepted.
		iii	3 1	3 marks for method 1 mark for answer & unit If the candidates do not include the moment of the ruler (0.42 Nm) in the clockwise moments, but then proceed to work everything correctly, deduct 1 mark from the method and 1 mark for the answer.
	c	smaller	1	
<b>TOTAL</b>			<b>10</b>	

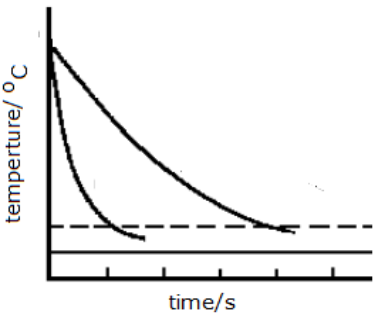
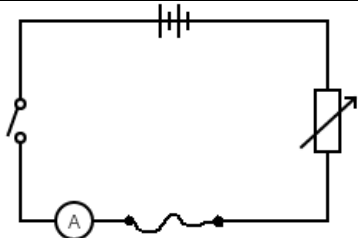
PAPER 2A						
Question	Answer	Mark	Guidelines			
1.	a.	i		1 1	1 mark each for drawing and labelling Award full marks if the arrow of upthrust is drawn below the object, as long as it is acting upward. Weight should be from centre of object. Do not accept gravity instead of weight.	
			ii	-10 m/s <sup>2</sup>	1	Value and unit
			iii	$F = ma$ $= 0.1 \times (-10)$ $= -1 \text{ N}$	1 1	Working Answer & unit If the candidates use +10 instead of -10, use F.T.
			iv	0 m/s	1	Award full marks even without units.
			v	$v^2 = u^2 + 2as$ $0^2 = u^2 + 2(-10)(9)$ $u = 13.4 \text{ m/s}$	2	1 mark for working 1 mark for answer & unit If u and v are inverted, do not award any marks, as both method and answer will be incorrect. Accept the use of equations for conversion of energy from KE to PE.
			vi	$v = u + at$ $0 = 13.4 + (-10) \times t$ $t = 1.34 \text{ s}$	2	1 mark for method 1 mark for answer & unit Allow for the use of other equations of motion to give the right answer. If u and v are inverted, do not award any marks, as both method and answer will be incorrect.
	b.	Deceleration increases. It will reach less height.	1 1			
	c.	i	$p = m v$ $= (0.042) (300)$ $= 12.6 \text{ kgm/s}$	2	1 mark for method 1 mark for conversion of unit	
		ii	$12.6 = (0.042 + 0.1)v$ $v = 88.7 \text{ m/s}$	2	1 mark for method 1 answer & units	
	d.	i	For every action there is an equal and opposite reaction. Newton's third law of Motion	1		
			OR The law of conservation of momentum	1		



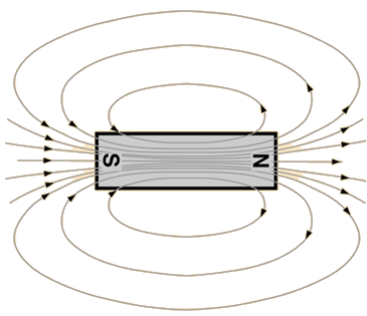
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		ii	The foam will increase the time of impact between the rifle and the shoulder thus reducing the force.	1	1 mark for increase in time,
				1	1 mark for decrease in force
<b>TOTAL</b>				<b>20</b>	
2	a	i	Any TWO of the following: - <ul style="list-style-type: none"> <li>• They can all travel in a vacuum.</li> <li>• They can all be reflected, refracted and diffracted. (these can be listed as 3 separate properties)</li> <li>• They are all transverse waves.</li> <li>• They are all carriers of energy.</li> </ul>	2	Do not accept 'have no mass'.
		ii	Any TWO of the following: - Gamma / X-Rays / Ultra Violet	2	
		iii	$V = f \times \lambda$ $f = 3 \times 10^8 / 25 \times 10^{-6}$ $= 1.2 \times 10^{13} \text{ Hz}$	2	1 mark for method 1 mark for answer & unit
		iv	Infrared – TV remote controls, burglar alarms, IR cameras. Radio waves – radio communication, space exploration, radar.	1 1	Accept any other correct answers such as oven and heater.
	b	i	Convex/Converging	1	
		ii	Refract / Converge	1	Do not accept 'bend'.
		iii	Position the lens between a distant bright source of light and a screen. Move the lens to and from until a bright image of the distant object is obtained on the screen. Measure the distance between the lens and the screen.	1 1 1	Accept also positioning the object and image until they are both at 2F, and then dividing by 2.
	c	i	Any value smaller than 120 mm.	1	Do not accept 'any value around 120mm', it has to be smaller.
		ii	Height of image = height of object x magnification $= 1.5 \times 4$ $= 6 \text{ cm}$	2	1 for method 1 for answer & unit
		iii		2	1 mark for the correct drawing of rays, including arrows (even if they don't fit in full grid) 1 mark for drawing and labelling the image I. Do not deduct marks if the rays extended backwards are not dotted.
		iv	Virtual Upright	1 1	Do not accept 'not real'.
<b>TOTAL</b>				<b>20</b>	
3	a	i	conduction	1	
		ii	radiation	1	
		iii	conduction or convection	1	
		iv	conduction AND convection	2	1 mark each

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b	i	1. fill each flask with same volume of hot water at same temperature	1	If point 1 is not mentioned in the method, remove the marks. However then accept them as correct precautions in (ii). Do not award the marks twice if they are used both in the method and precautions.					
		2. read initial temperature of both with a thermometer	1						
		3. repeat temperature readings at regular time intervals	1						
			1						
		ii	Any TWO valid precautions, such as: - leave flask unopened for shortest time when taking readings; - avoid other heat sources in the room; - stir water.	2	1 mark each				
		iii.	<table border="1" style="display: inline-table; vertical-align: middle;"> <thead> <tr> <th>Time/s</th> <th>Temperature of water in glass (°C)</th> <th>Temperature of water in steel flask (°C)</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	Time/s	Temperature of water in glass (°C)	Temperature of water in steel flask (°C)			
Time/s	Temperature of water in glass (°C)	Temperature of water in steel flask (°C)							
iv	y-axis (temperature/°C) 	1 2	Quantity and unit Award 1 mark only if straight lines are drawn. Deduct 1 mark if the temperature is reduced down to zero. It should stop at room temperature.						
v	Facilitates comparison of curves .	1							
vi	The one with smaller gradient at the beginning is better at keeping liquid at their temperature.	1	Accept also the flask that keeps liquid at the highest temperature after a given time.						
c	Since it is an insulator, it reduces heat transfer from outside to inside of flask.	1 1							
		<b>TOTAL</b>	<b>20</b>						
4.	a	i		3	2 marks for correct symbols 1 mark for correct placement Accept the symbol of a fuse instead of wire.				
		ii	<ul style="list-style-type: none"> <li>The apparatus was switched on and the variable resistor was set.</li> <li>The resistance was decreased gradually until the copper wire melted.</li> <li>The current reading was taken as soon as the wire melted.</li> <li>This procedure was repeated each time by varying the thickness of the copper wire.</li> </ul>	4	1 mark for each correct statement.				

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	iii	The apparatus was checked for any loose connections. The rheostat was varied gradually to ensure the <u>precise current measurement</u> .	1	Accept any other correct precaution.
	iv	The thicker the wire the higher the current needed to melt it.	1	Do not accept directly proportional. If both are listed, give a zero. Only the 1 <sup>st</sup> answer should be listed for the full 1 mark to be awarded.
b	i	$R_T = 6 \Omega$ $I = V / R$ $I = 12 / 6 = 2 \text{ A}$ No the fuse will not melt.	1 1 1	Deduct 1 mark if unit/units are missing. Mark the answer of whether the fuse will melt using FT, relative to the calculation for current performed. Do not accept that 'the fuse will not melt' without any backup of a calculation.
	ii	$R_T = 1.3 \Omega$ $I = V / R$ $I = 12 / 1.3 = 9.2 \text{ A}$ Yes, the fuse will melt.	1 1 1	Deduct 1 mark if unit/units are missing. Mark the answer of whether the fuse will melt using FT, relative to the calculation for current performed. Do not accept that 'the fuse will not melt' without any backup of a calculation.
c		Length	1	
		Type of material	1	
		Temperature	1	
d		Circuit breaker (Accept 'Salva Vita'), Earth wire	1, 1	
<b>TOTAL</b>			<b>20</b>	
5.	a	A wire is wrapped around a steel bar. A Direct Current is passed through the wire. The circuit is switched off and the wire is unwrapped leaving a permanent magnet.	1 1 1	
	b		3	1 (N and S) 1 (drawing of field lines) (not intersecting) 1 (direction of arrows from north to south)
	c	Heating OR Hammering OR Passing an A.C. through the bar .	1	Accept any. Accept 'dropping'.
	d	i	It becomes an electromagnet.	1

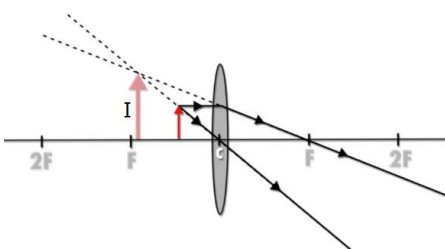
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	ii	Increase the number of turns around the iron core	1		
		Increase the current/ voltage	1		
		Effect: This increases the magnetic field strength	1		
	iii	The switch is switched on and current flows through the iron core and it becomes temporary magnetised.	1		
		The iron rod is attracted towards the temporary magnet.	1		
		The contact points make contact.	1		
		A complete circuit is now formed, and the bulb lights up.	1		
	iv	As the iron core becomes magnetised it will attract the iron bar.	1		
		The points of contact will separate (break circuit).	1		
		The bulb will not light up.	1		
	v	As a circuit breaker, if a high current passes,	1		
		it will break off the current around the house.	1		
	<b>TOTAL</b>				<b>20</b>

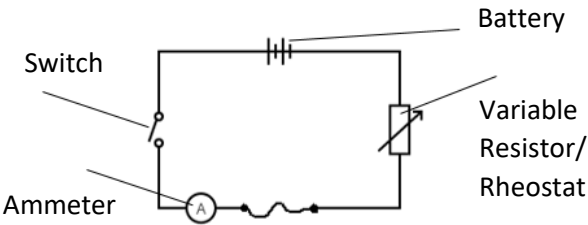
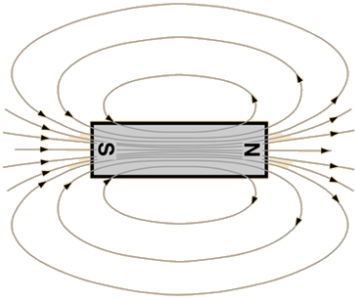
## MARKING SCHEME: SEC PHYSICS (MAIN SESSION 2019)

PAPER 2B						
Question	Answer	Mark	Guidelines			
1.	a	i	F1 = Upthrust / upward force F2 = Weight	1 1	Do not award mark if the answer is gravity. Accept Thrust, but do not accept 'engine force'.	
		ii	-10 m/s <sup>2</sup>	1	Value and unit	
		iii	F = ma = 0.1 x (-10) = -1N	2	1 mark for working 1 mark for answer & unit.	
		iv	0 m/s	1	Award full marks even without units.	
		v	v <sup>2</sup> = u <sup>2</sup> + 2as 0 <sup>2</sup> = u <sup>2</sup> + 2(-10)(9) u = 13.4 m/s	2	1 mark for working 1 mark for answer + unit	
		vi	v = u + at 0 = 13.4 + (-10) x t t = 1.34 s	2	1 mark for method 1 mark for answer & unit Allow for the use of other equations of motion to give the right answer.	
	b	i	p = mv = (0.042)(300) = 12.6 kgm/s	2	1 mark for the method 1 mark for answer & units Do not award any marks if the equation for Momentum = Force x distance is used, but then a correct answer is obtained.	
			ii	... before collision = total momentum after collision (or total momentum is conserved), provided that no external forces act on the system.	1 1	
			iii.	0.042 + 0.1 = 0.142 kg	1	
		iv.	12.6 = (0.042 + 0.1) v v = 88.7 m/s	1 1	1 mark for method 1 answer & units	
	c	i	For every action there is an equal and opposite reaction.	1		
		ii	Impulse: - The foam will increase the time of impact between the rifle and the shoulder thus reducing the force.	1 1	Do not award marks if no mention of increase in time. The term impulse is not required. Accept any other reference to an increase in time, such as 'the recoil is slowed down'.	
		<b>TOTAL</b>	<b>20</b>			
2.	a	i	Any TWO of the following: - <ul style="list-style-type: none"> <li>• They all travel at the same speed.</li> <li>• They can all travel in a vacuum.</li> <li>• They can all be reflected, refracted and diffracted.</li> <li>• They are all transverse waves.</li> <li>• They are all carriers of energy.</li> </ul>	2	Do not accept that they are EM waves.	

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	ii	$V = f \times \lambda$ $f = 3 \times 10^8 / 25 \times 10^{-6}$ $= 1.2 \times 10^{13} \text{ Hz}$	1 1 1	1 for substitution 1 for subject of formula 1 mark for answer & unit						
	iii.	Any two of the following: - Gamma / X-Rays / Ultra Violet / Microwaves	2							
	b	<ul style="list-style-type: none"> <li>Convex</li> <li>Converge</li> </ul>	1 1							
	c	i. The distance between the centre of the lens and the focus is 12 cm	1	No marks if the distance is not from centre of lens.						
		ii. <table border="1" style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="padding: 2px;">Move the lens towards and away from the screen until a sharp image of the distant object is obtained on the screen.</td> <td style="text-align: center; padding: 2px;"><b>2</b></td> </tr> <tr> <td style="padding: 2px;">Position the lens between a distant bright source of light and a screen.</td> <td style="text-align: center; padding: 2px;"><b>1</b></td> </tr> <tr> <td style="padding: 2px;">Measure the distance between the lens and the screen.</td> <td style="text-align: center; padding: 2px;"><b>3</b></td> </tr> </tbody> </table>	Move the lens towards and away from the screen until a sharp image of the distant object is obtained on the screen.	<b>2</b>	Position the lens between a distant bright source of light and a screen.	<b>1</b>	Measure the distance between the lens and the screen.	<b>3</b>	3	1 mark for each correct position.
Move the lens towards and away from the screen until a sharp image of the distant object is obtained on the screen.	<b>2</b>									
Position the lens between a distant bright source of light and a screen.	<b>1</b>									
Measure the distance between the lens and the screen.	<b>3</b>									
	d	i. $M = \text{height of image/height of object}$ $= 6 / 1.5$ $= 4$	2	1 mark for method 1 mark for answer Do not award the 1 mark for the answer if any unit is added together with the value.						
		ii. 	3	2 marks for rays + the respective arrows  1 mark for drawing and labelling the image I						
		iii. Enlarged upright	1 1							
<b>TOTAL</b>			<b>20</b>							
3.	a	i. conduction	1							
		ii. radiation	1							
		iii. Conduction OR Convection	1	Accept any						
		iv. Conduction AND Convection	2	1 each						
	b	i. from top: 3, 4, 2, 1.	4	1 each						
		ii. Any valid precaution that is not listed in the method, such as: - stir water before reading thermometer - ensure there are no other external heat sources - take repeated readings of temperatures - read thermometer at eye-level.	2	1 each Do not accept fill with same amount of liquid and same initial temperature as these are already listed in the method. Vague answers such as 'eye level' are not accepted.						
		iii. Time (s/min) Temperature of water in the steel flask (°C)	1 1 1	No marks allocated for the unit of temperature as it is already listed in the given column.						
		iv. y-axis – temperature (°C), x – axis – time (s) units	1 1							
		v. Facilitates comparison of curves.	1	or equivalent reply						

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		vi	Curve with smaller gradient at the beginning (top curve).	1	Accept also the flask that keeps liquid at the highest temperature after a given time.
		c	They do not allow heat to enter from the surroundings, as Insulation works both ways.	1 1	
<b>TOTAL</b>				<b>20</b>	
4.	a	i	 <p style="text-align: center;">Battery Switch Ammeter Variable Resistor/ Rheostat</p>	4	Do not accept AMP METER
		ii	wire variable resistor current decreased melted	1 1 1 1 1	
		iii	The thicker the wire the higher the current needed to burn the wire.	1	
	b	i	$R_T = 4 + 2 = 6 \Omega$	1	
		ii	$I = V / R$ $I = 12 / 6 = 2 \text{ A}$	1 1	Deduct 1 mark if unit is missing.
		iii	No the fuse will not melt	1	Use FT from previous answer.
		iv	$1/R_T = 0.5 + 0.25 = 0.75$ $R_T = 1.3 \Omega$	1 1	Deduct 1 mark if unit/units are missing.
		v	$I = V / R$ $I = 12 / 1.3$ $I = 9.2 \text{ A}$	1 1	Deduct 1 mark if unit/units are missing
		vi	Yes the fuse will burn.	1	Use FT from previous answer.
	c		Circuit breaker OR Earth wire	1	Accept 'Salva Vita', plastic casing & double insulation.
<b>TOTAL</b>				<b>20</b>	
5.	a		Steel, Direct	1,1	
	b			3	1 (N and S) 1 (drawing of field lines) (not intersecting) not dotted 1 (direction of arrows from north to south)
	c		Heating Hammering Passing an A.C. through the bar Dropping	1	Accept any
	d	i	As the current passes around the core, it becomes an electromagnet.	1 1	Accept 'becomes temporarily magnetised'.

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	ii	2, 3, 1, 4, 5	5	1 mark for each correct answer
	iii	Increase the number of turns around the iron core	1	
		Increase the current / voltage	1	
	iv	As the iron core becomes magnetised it will attract the iron rod.	1	
		The points of contact will separate.	1	
		The bulb will not light up.	1	
	v	If a high current flows, it will break off the current around the house.	1 1	
<b>TOTAL</b>			<b>20</b>	