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Examiners' Report
November 2012

GCSE Applied Physics 5PH2F 01

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November 2012

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Introduction

This is the second examination of the second unit of the new specification.

The structure of the examination will be consistent throughout the series.

This report will provide exemplification of candidates' work, together with tips and/or comments, for a selection of questions.

The exemplification will come mainly from questions that required more complex responses from candidates.

The overall impression of the examiners was that the vast majority of candidates coped well with this examination.

Successful candidates:

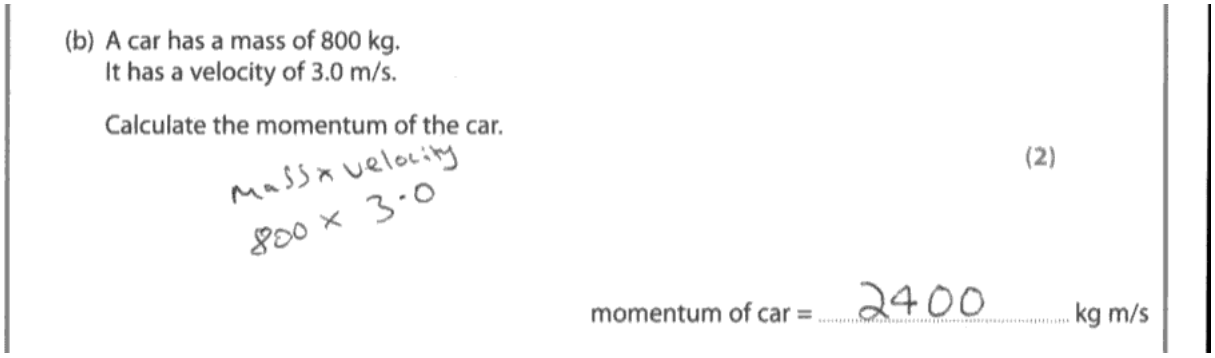
- read the questions carefully and answered the questions as they were set
- used scientific words correctly
- were willing to think through the possibilities and apply their knowledge when the question asked for suggestions to explain new situations
- were able to tackle calculations methodically and show the stages in their working
- were able to construct their explanations in a logical order, using the marks at the side of the questions as a guide.

Less successful candidates:

- did not read the questions carefully, and gave answers that were related to the topic being tested, but did not answer the question
- did not understand the meaning of key scientific words and phrases
- found difficulty in applying their knowledge to new situations
- did not show the stages in their working
- did not think through their answers before writing

Question 1 (b)

Most candidates did the correct substitution and calculation. A small number tried to substitute into the wrong equation, dividing rather than multiplying. There were occasional powers of ten errors. A common problem with all the calculation questions in this paper was the candidates' reluctance to show working which meant that credit could not be given for starting with the right idea but then doing something wrong.


(b) A car has a mass of 800 kg.
It has a velocity of 3.0 m/s.

Calculate the momentum of the car.

(2)

mass × velocity
800 × 3.0

momentum of car = 2400 kg m/s

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Examiner Comments

Almost all candidates who quoted the correct equation went on to score both marks

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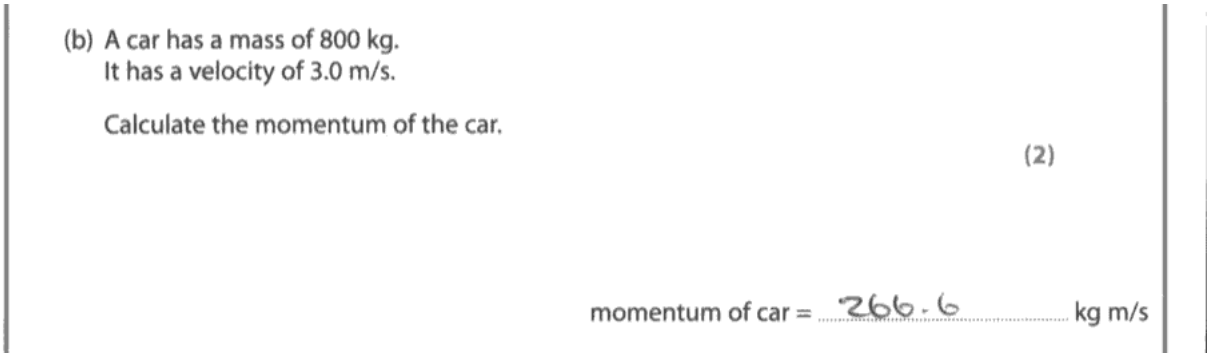
Examiner Tip

Encourage candidates to write down the equation they are using from the front of the paper

Candidates who did not write down the equation often made mistakes


(b) A car has a mass of 800 kg.
It has a velocity of 3.0 m/s.

Calculate the momentum of the car.

(2)

momentum of car = 266.6 kg m/s

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Examiner Comments

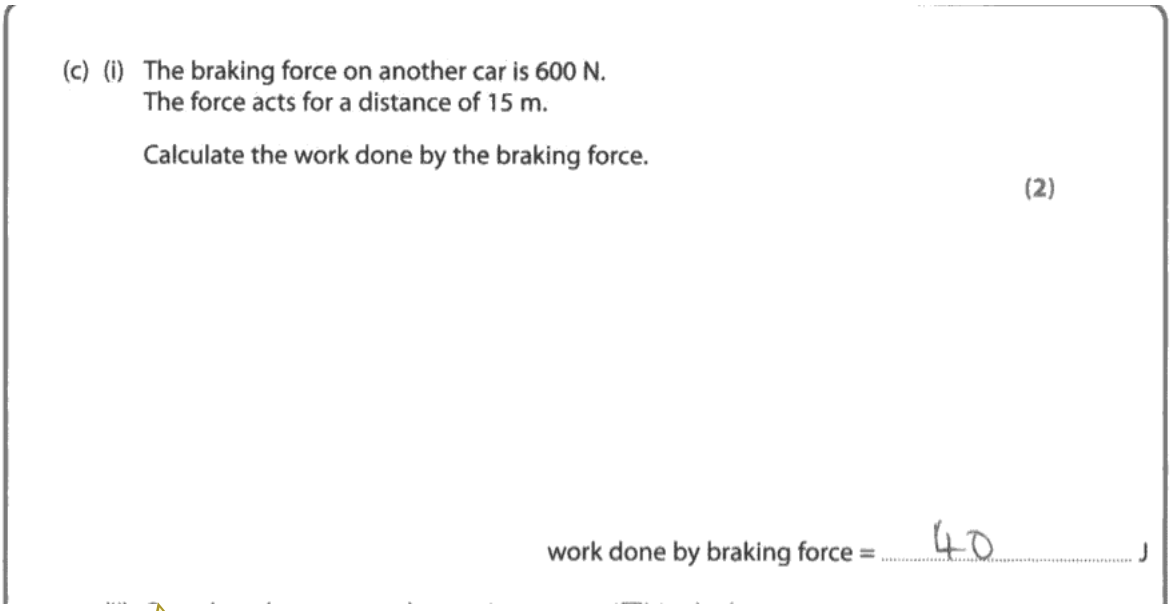
The candidate has chosen to divide mass by velocity.

Question 1 (c) (i)

Most candidates did the correct substitution and calculation. A small number tried to substitute into the wrong equation.

Over 80% of candidates scored both marks on this question.

One of the responses that failed to score. Again, these were usually candidates who did not write down the equation and then show their substitution into the equation.



(c) (i) The braking force on another car is 600 N.
The force acts for a distance of 15 m.

Calculate the work done by the braking force.

(2)

work done by braking force = 40 J

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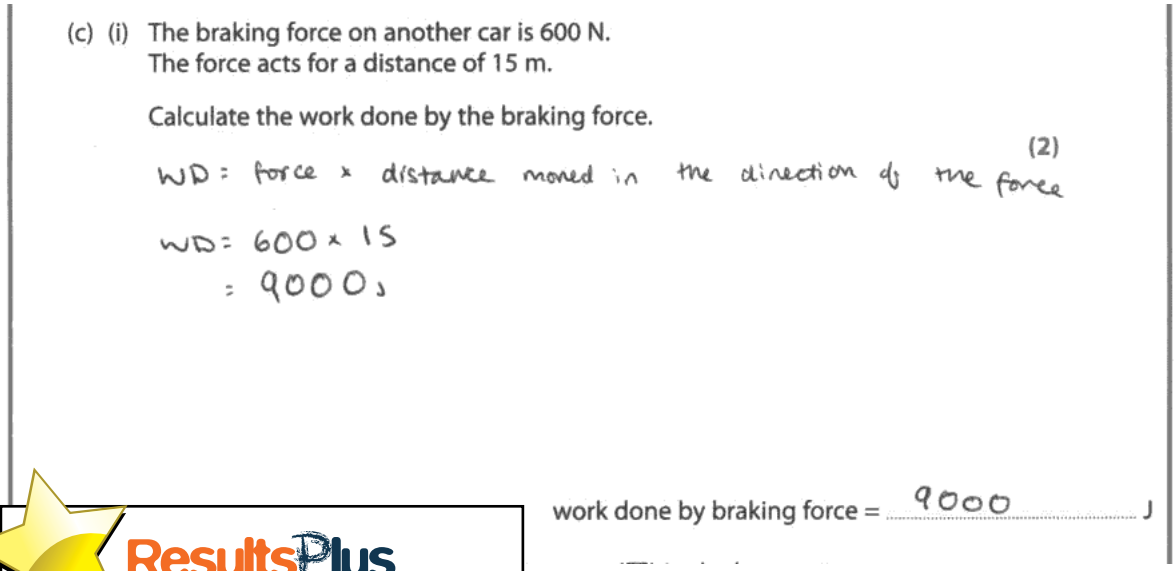
Examiner Comments

A few candidates chose to divide the braking force by the distance

Most of the correct answers set out their working as shown.



(c) (i) The braking force on another car is 600 N.
The force acts for a distance of 15 m.

Calculate the work done by the braking force.

(2)

WD = force × distance moved in the direction of the force

WD = 600 × 15
= 9000 J

work done by braking force = 9000 J

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Examiner Comments

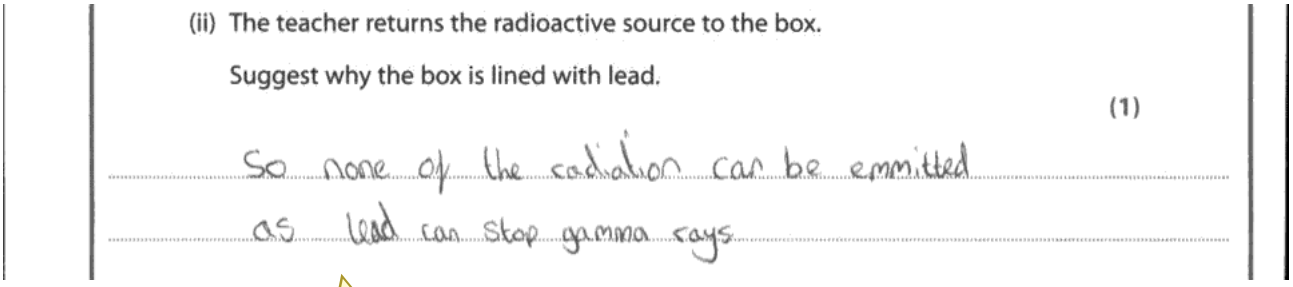
They were not all as neat as this.

Question 2 (a) (ii)

Many candidates were successful with this question but very few (if any) used the word absorb, and ionising was used even less. A few candidates thought that lead was a good conductor and that this was important in this context. A significant number did not make a creditworthy response as they referred to the source itself not being able to penetrate.

About two thirds of candidates scored this mark.

A common response


(ii) The teacher returns the radioactive source to the box.

Suggest why the box is lined with lead.

(1)

So none of the radiation can be emmitted as lead can stop gamma rays

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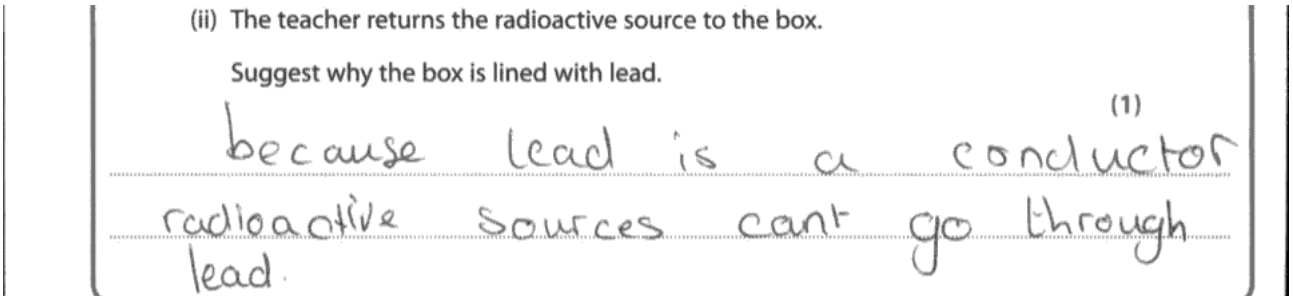
Examiner Comments

Answers stating that all the radiation was stopped were acceptable at this level in the paper

This response contains two non-scoring points.


(ii) The teacher returns the radioactive source to the box.

Suggest why the box is lined with lead.

(1)

because lead is a conductor radioactive sources cant go through lead.

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Examiner Comments

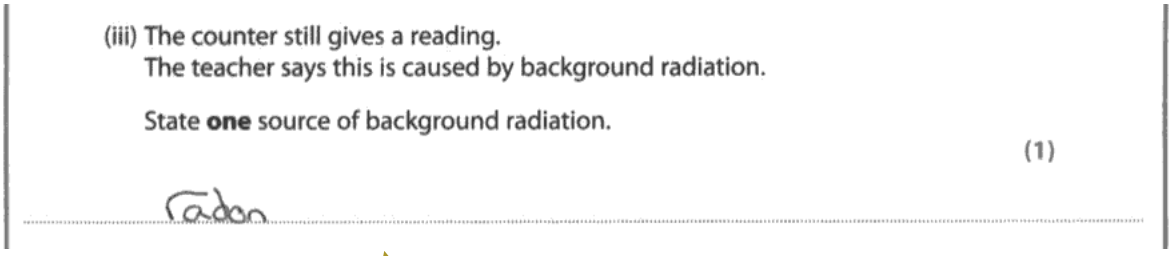
Many candidates confused sources with a type of radiation

Question 2 (a) (iii)

Many candidates were successful and the most common answer was Radon. Of those that were not, the majority named a type of radiation rather than a source. A few were not specific enough and just wrote 'Nuclear' as their answer. Some candidates thought the question referred to the lead lined box or the experiment specifically and so answered to the effect of 'left-over radiation from the box'. Too many gave microwaves or mobile phones and some confused cosmic background radiation (or big bang) with cosmic rays.

Only 50% of candidates scored this mark.

An example of the most common correct response.


(iii) The counter still gives a reading.
The teacher says this is caused by background radiation.

State **one** source of background radiation.

(1)

Radon

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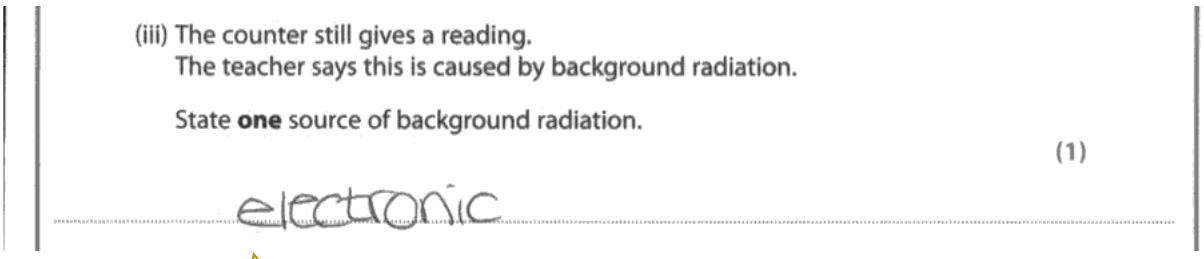
Examiner Comments

radon is acceptable for radon gas.

An example of an incorrect response.


(iii) The counter still gives a reading.
The teacher says this is caused by background radiation.

State **one** source of background radiation.

(1)

electronic

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Examiner Comments

Microwaves (perhaps linked to CMBR) and mobile phones were other common non-scoring responses.

Question 2 (a) (iv)

A minority achieved both marks for this question. Of those that did not, many concentrated on safety of the demonstrator, general lab safety items such as goggles and gloves or they made the same point in two different ways. Some thought that "students touching the sources" was acceptable provided they washed their hands after touching.

35% of candidates scored both marks and 44% scored one mark.

This response scored both marks.

(iv) The teacher takes precautions to protect her students from the radiation emitted by the radioactive sources.

State **two** suitable precautions that protect the students.

(2)

1 Do not touch the radioactive material

2 Do not get too close

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Examiner Comments

'Do not get too close' is acceptable for keeping students at a safe distance.

Weaker candidates often gave the same point in both answer spaces.

(iv) The teacher takes precautions to protect her students from the radiation emitted by the radioactive sources.

State **two** suitable precautions that protect the students.

(2)

1 Move the children into another room

2 keep them at a far distance

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Examiner Comments

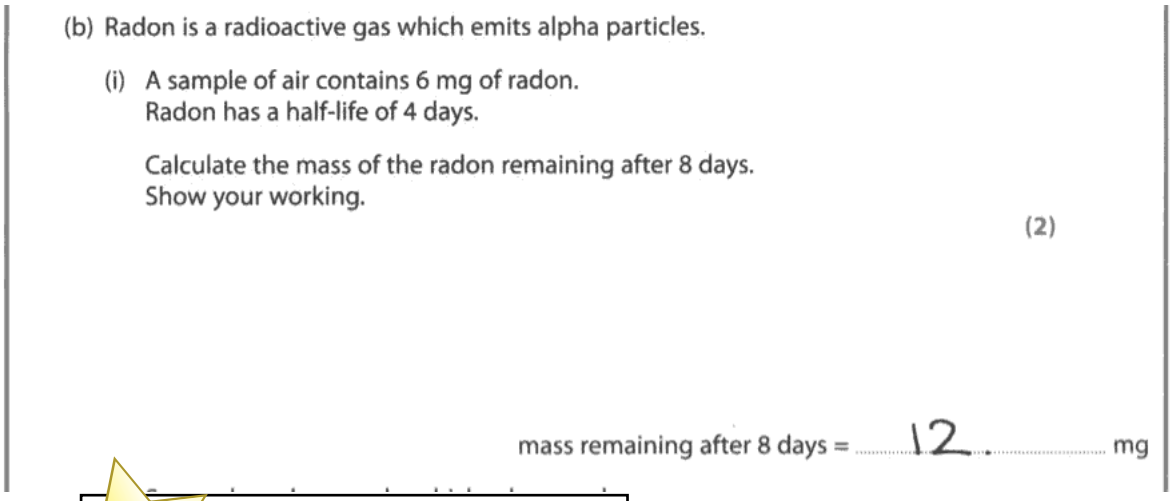
Both points refer to keeping students at a safe distance.

Question 2 (b) (i)

Many candidates had a poor grasp of the meaning of half-life. Although 30% gained both marks, few showed a calculation to give the number of half-lives. A small number tried to calculate the mass having gone through 8 half-lives. A lot thought that there were 6mg after 4 days and therefore only took this value through 1 half-life. As in 1(b) the lack of working meant that credit could not be given for 3mg which could have been obtained by using an incorrect method.

Only 15% scored 1 mark.

A common response with no working.



(b) Radon is a radioactive gas which emits alpha particles.

(i) A sample of air contains 6 mg of radon.
Radon has a half-life of 4 days.

Calculate the mass of the radon remaining after 8 days.
Show your working.

(2)

mass remaining after 8 days = 12 mg

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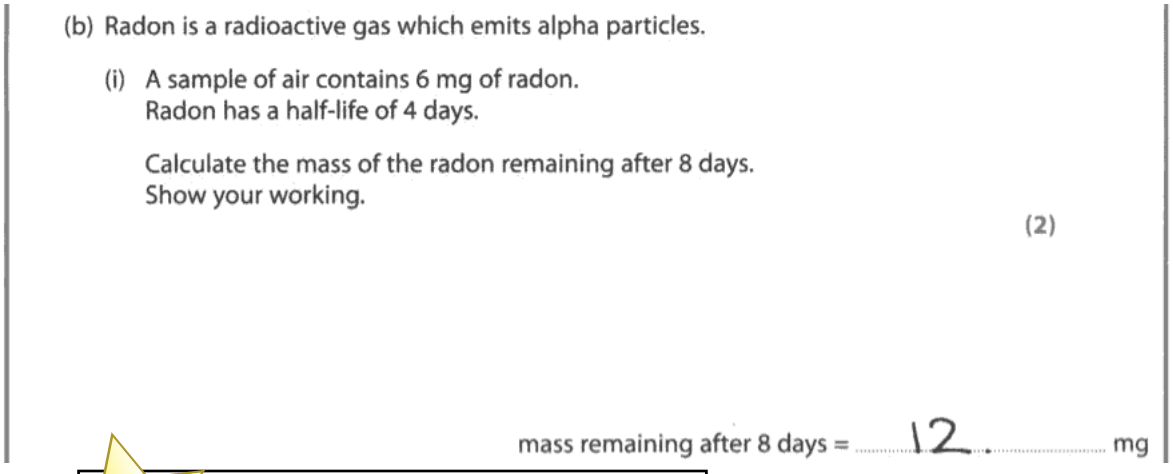
Examiner Comments

Encourage students to show working.

Responses scoring both marks usually gave clear evidence of their working.



(b) Radon is a radioactive gas which emits alpha particles.

(i) A sample of air contains 6 mg of radon.
Radon has a half-life of 4 days.

Calculate the mass of the radon remaining after 8 days.
Show your working.

(2)

mass remaining after 8 days = 12 mg

ResultsPlus
Examiner Comments

A good example of how to set out working.

Question 2 (b) (ii)

Most candidates managed to get 1 (43% of candidates) or 2 (14% of candidates) marks for this question, most commonly by saying the gas could be inhaled or cause cancer. Decay or ionisation of lung cells was rarely seen. Some indicated 'damage to cells' but many answers were vague and referred to damage to the body or just repeated the question.

A typical one mark response.

(ii) Some places have rocks which release radon gas.
Explain why people living in these places may have an increased risk of long-term health problems.

(2)

People living in these places may have an increased risk or long-term health problems because there is constant background radiation that has quite a big mass which could later cause cancer.

(Total for Question 2 = 9 marks)

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Examiner Comments

Cancer scores one mark.

One of the less common 2 mark responses.

(ii) Some places have rocks which release radon gas.
Explain why people living in these places may have an increased risk of long-term health problems.

(2)

Because Radon ~~gas~~ emits alpha particles the ~~particles can be~~ gas may be breathed in by people. The Radon gas would then be emitting alpha particles inside the persons body which then lead to cancer

ResultsPlus
Examiner Comments

Marks are scored for 'inhaling gas' and 'cancer'.

Question 3 (b) (i)

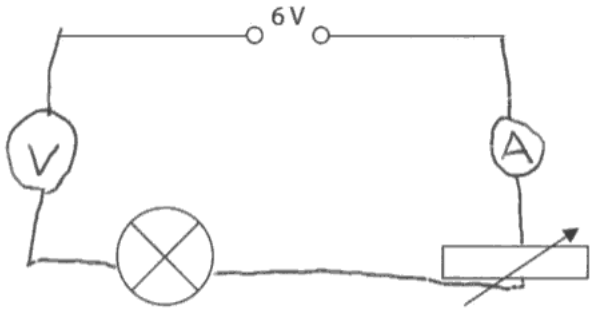
Most candidates could draw the correct symbols for at least one ammeter or voltmeter and they usually put ammeter in series. Candidates were less confident in recalling that the voltmeter should be connected in parallel with the bulb. The most common error was placing the voltmeter in series with the bulb and the ammeter followed by having the voltmeter in parallel with the variable resistor, the battery or even random sections of the connecting wires. Most candidates used a pen to draw the wiring diagram and then added the meters so that they had an (incorrect) line drawn through the symbol which was not penalised.

Only 15% of candidates failed to score any marks on this question and 23% scored all 3 marks.

This response was the most common way that one mark was scored.

(i) Complete the circuit below with an ammeter and a voltmeter correctly connected.
The power supply, variable resistor and lamp symbols are already drawn for you.

(3)



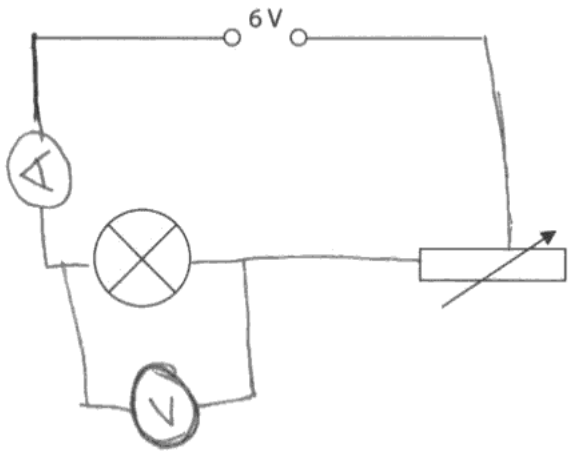
ResultsPlus
Examiner Comments

One mark for a correct meter symbol.

This response scored 3 marks

(i) Complete the circuit below with an ammeter and a voltmeter correctly connected.
The power supply, variable resistor and lamp symbols are already drawn for you.

(3)



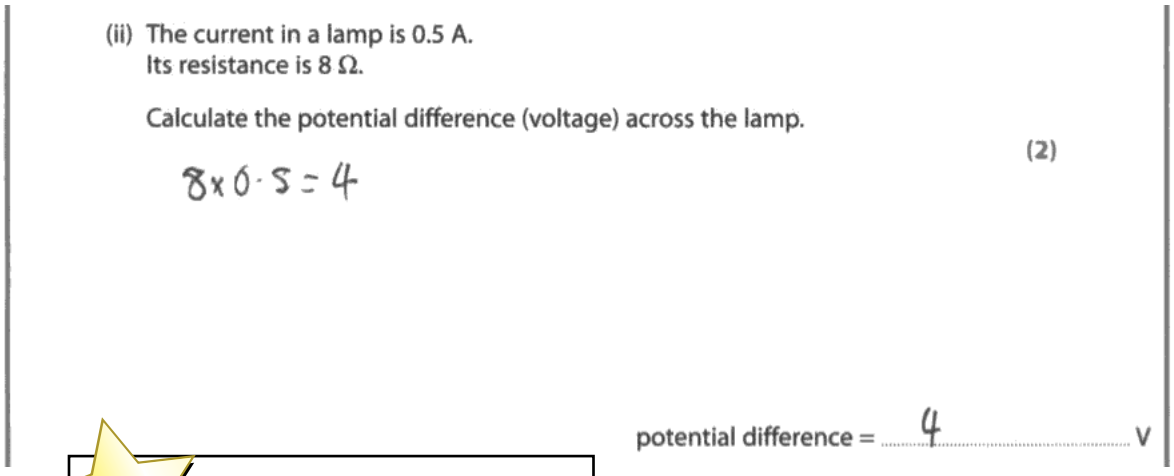
ResultsPlus
Examiner Comments

The error in connecting to the variable resistor was ignored.

Question 3 (b) (ii)

Most candidates did the correct substitution and evaluation. As before a significant number divided instead of multiplying and too many failed to show any working.

One of the many responses scoring both marks.



(ii) The current in a lamp is 0.5 A.
Its resistance is 8 Ω.

Calculate the potential difference (voltage) across the lamp.

(2)

8 x 0·5 = 4

potential difference = 4 V

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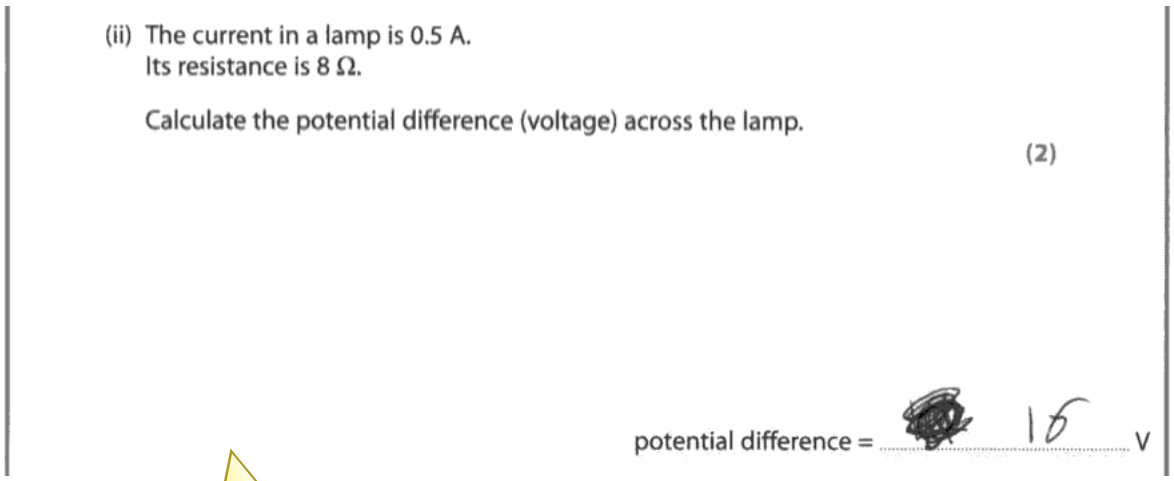
Examiner Comments

Correct substitution and evaluation.

One of the candidates who chose to divide 8 by 0.5.



(ii) The current in a lamp is 0.5 A.
Its resistance is 8 Ω.

Calculate the potential difference (voltage) across the lamp.

(2)

potential difference = 16 V

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Examiner Comments

Would the same mistake have been made if the equation was copied out?

Question 3 (c)

Whilst most candidates could identify heat as the waste energy many candidates did not explain adequately where in the circuit this was produced. Although many candidates sort of implied that they meant heat lost in the bulb they were not clear enough to get the mark.

Only 17% of candidates scored both marks for this question, with a further 31% scoring one mark.

A non-scoring response.

(c) Some electrical energy is transferred to light energy in the lamp.

Explain why only some of the electrical energy is transferred to light energy in the lamp.

(2)

The electrical energy in the circuit is transferred to light energy because some of the electricity is needed to be taken to power the lamp., reducing the amount of the electrical energy.

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Examiner Comments

No mention of thermal energy

One of the responses scoring both marks.

(c) Some electrical energy is transferred to light energy in the lamp.

Explain why only some of the electrical energy is transferred to light energy in the lamp.

(2)

Only some of the electrical energy is transferred to light energy because some energy is lost as heat energy in the lamp.

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Examiner Comments

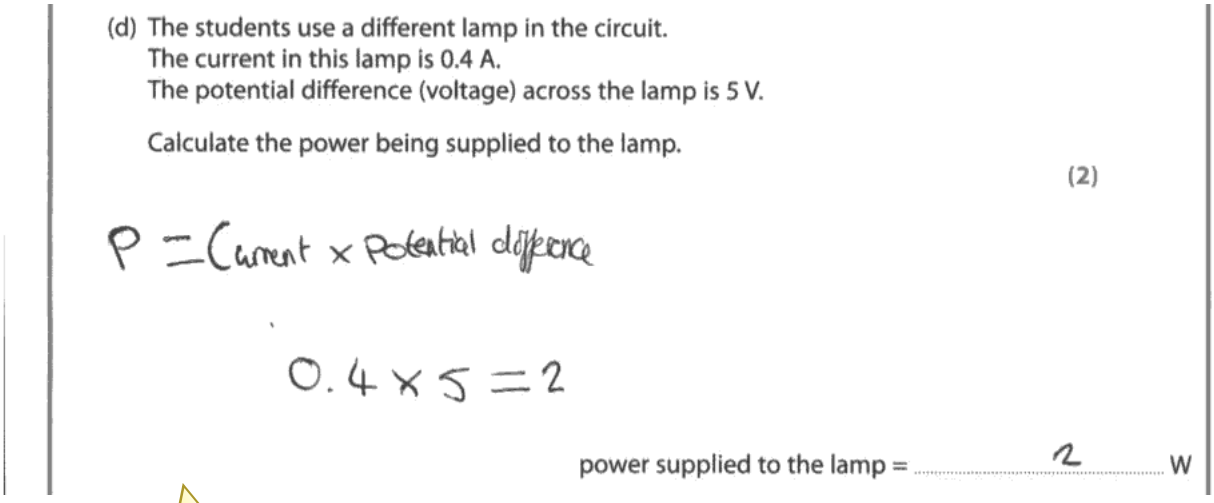
Clear indication that thermal energy is transferred in the lamp.

Question 3 (d)

Most did the correct substitution and evaluation, with almost 77% scoring both marks on this question.

A significant number attempted the wrong substitution leading them to actually calculating the resistance.

One of the many responses scoring both marks.



(d) The students use a different lamp in the circuit.
The current in this lamp is 0.4 A.
The potential difference (voltage) across the lamp is 5 V.

Calculate the power being supplied to the lamp.

(2)

P = Current x Potential difference

0.4 x 5 = 2

power supplied to the lamp = 2 W

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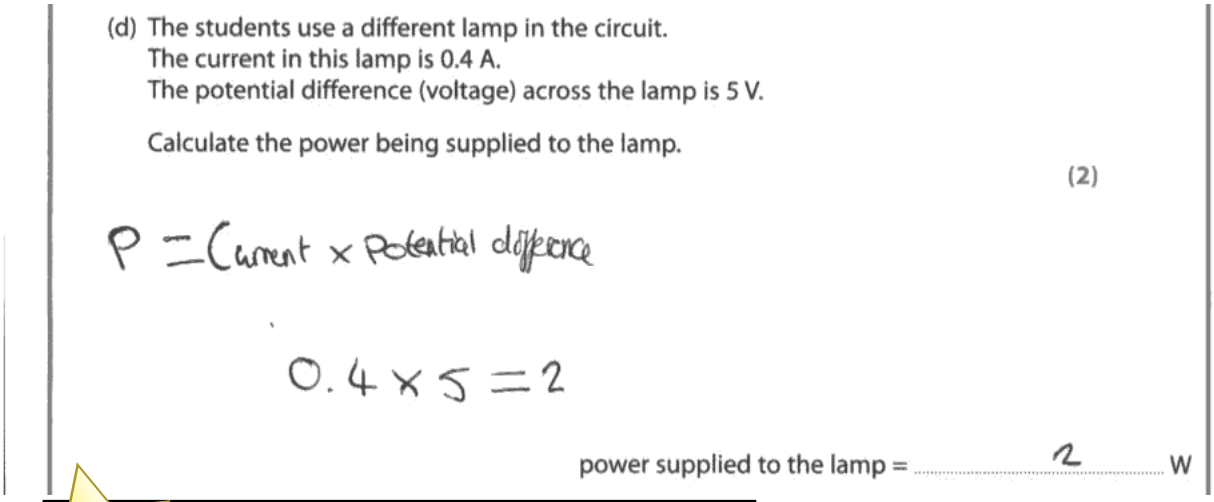
Examiner Comments

Correct substitution and evaluation.

An incorrect response.



(d) The students use a different lamp in the circuit.
The current in this lamp is 0.4 A.
The potential difference (voltage) across the lamp is 5 V.

Calculate the power being supplied to the lamp.

(2)

P = Current x Potential difference

0.4 x 5 = 2

power supplied to the lamp = 2 W

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Examiner Comments

One of the candidates who thought they should be calculating resistance.

Question 4 (a) (i)

A majority gave the correct answer but some gave 17 or 18 which was unacceptable given such a clear graph.

Question 4 (a) (ii)

Most were awarded the mark for this question. The arrow shown in the diagram should have cued candidates into starting their arrow from the centre. The most common error was starting the arrow from a point too far below the centre of the block.

Question 4 (a) (iv)

Many candidates were able to substitute and evaluated correctly. However some chose to rearrange the equation and so gave the answer as 6. A common error was to give incorrect units for acceleration, with m/s being the most common but some seemed to choose any unit that came to mind.

60% of candidates scored either two or three marks for this question.

One of the responses scoring full marks.

(iv) Use the velocity/time graph to calculate the acceleration of the block during the first 2 s.
State the unit.

(3)

acceleration = change in velocity / time

$\frac{3}{2} = 1.5$

acceleration = 1.5 unit m/s^2

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Examiner Comments

Well set out responses usually scored most of the marks.

Only two marks.

(iv) Use the velocity/time graph to calculate the acceleration of the block during the first 2 s.
State the unit.

(3)

$\frac{3}{2}$

acceleration = 1.5 unit m/s

ResultsPlus
Examiner Comments

The most common reason for losing a mark was to give an incorrect unit for acceleration.

A response scoring one mark.

(iv) Use the velocity/time graph to calculate the acceleration of the block during the first 2 s.
State the unit.

$2 \times 3 = 6 \div 2 = 3$. (3)

acceleration = 3 unit m/s^2

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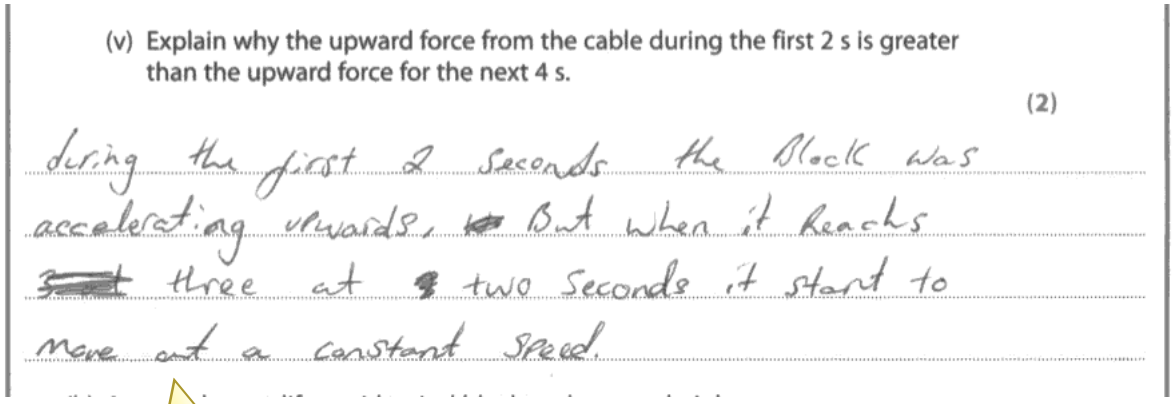
Examiner Comments

This candidate scored one mark for the correct unit.

Question 4 (a) (v)

It was disappointing that so many candidates were unable to correctly interpret the velocity/ time graph. Most scored one mark for either saying that that the block accelerated for the first two seconds and then travelled at constant speed for the next four. Some interpreted it as a distance-time graph and assumed that the constant velocity section represented the box being stationary and the final deceleration section meaning the box is being lowered. Others spoke of the weight of the box changing or more force being needed to start lifting objects.

A two mark response


(v) Explain why the upward force from the cable during the first 2 s is greater than the upward force for the next 4 s.

(2)

during the first 2 seconds the Block was accelerating upwards, But when it Reachs ~~three~~ at two seconds it start to move at a constant speed.

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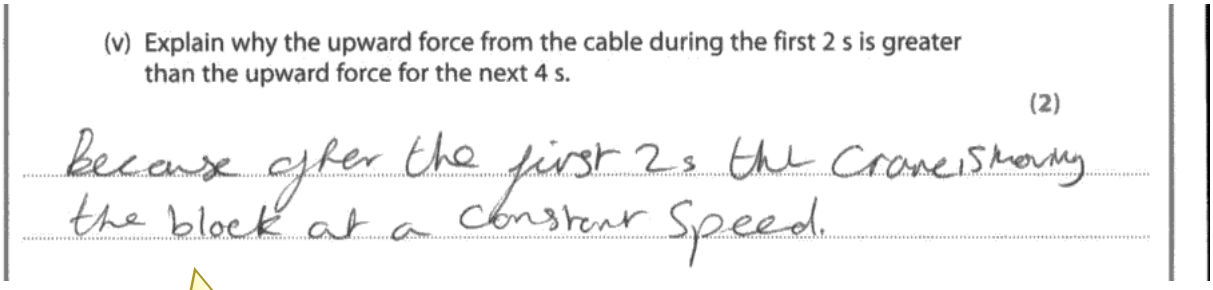
This was the most common type of response scoring two marks.

A typical response gaining one mark.


(v) Explain why the upward force from the cable during the first 2 s is greater than the upward force for the next 4 s.

(2)

Because after the first 2s the Crane is moving the block at a constant Speed.

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Examiner Comments

One mark for the idea that velocity is constant after the first two seconds.

Question 4 (b)

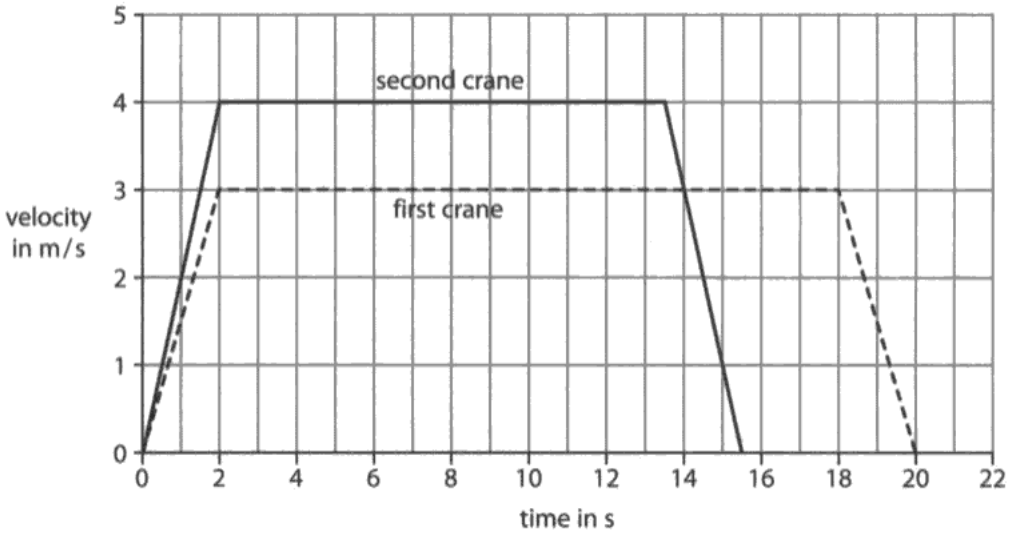
Many candidates (85%) gained the first mark but very few received the second mark as they failed to realise that power involved work done and so failed to mention it.

Most candidates gained one mark for observations about the greater velocity/acceleration or shorter time for the second crane.

A typical response scoring one mark.

This is the velocity/time graph for the second crane.

The graph for the first crane is shown as a dotted line.



The second crane has a larger power than the first crane.

Explain how the graph shows that the second crane has the larger power.

(2)

The second crane has a larger power because the acceleration is larger than the first crane at 2s. The first crane only reaces 3m/s velocity in 2s were as the second crane reaces 4m/s velocity in 2s.

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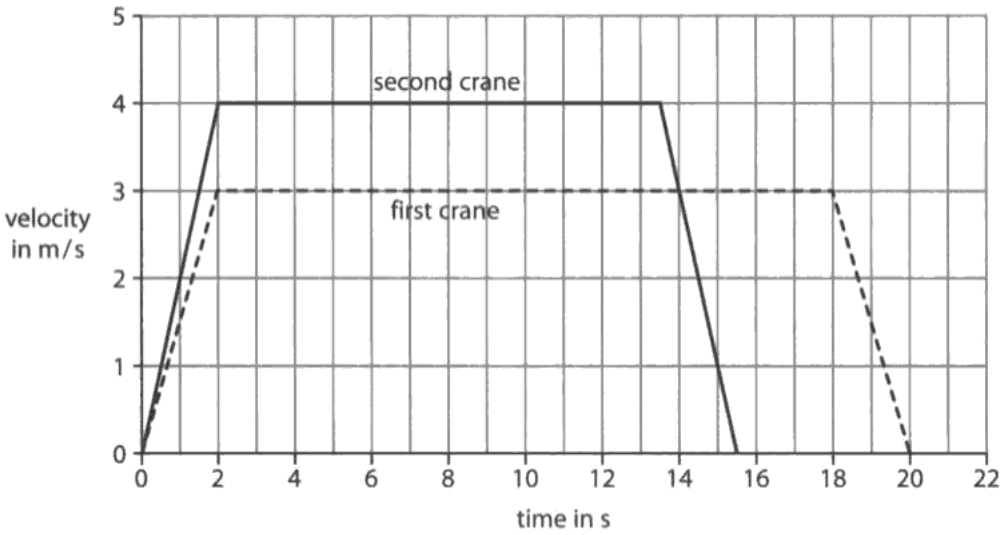
Examiner Comments

Has idea that 2nd crane has greater acceleration and also that it reaches a higher velocity.

One of the few responses to score both marks.

This is the velocity/time graph for the second crane.

The graph for the first crane is shown as a dotted line.



The second crane has a larger power than the first crane.

Explain how the graph shows that the second crane has the larger power.

(2)

The graph depicts the second crane having a larger power as its able to accelerate more as it has more velocity and it takes less time, and so basically it has more work the same amount of work done but in less time.

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Examiner Comments

Has stated 2nd crane has higher velocity and that work is done in a shorter time.

Question 5 (a) (i)

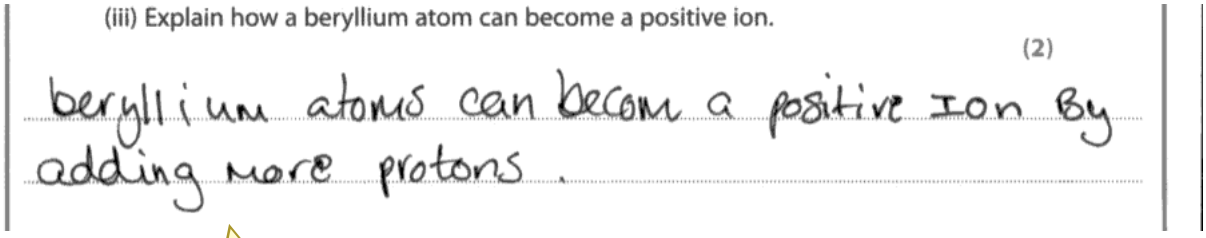
Most (86%) correctly gave neutron as the name of X.

Question 5 (a) (iii)

Only 26% correctly explained that the atom should lose an electron. Too many tried to add or remove a proton or even a neutron to ionise the beryllium atom.

Credit was given for attempting to alter the total charge.

This response was awarded one mark



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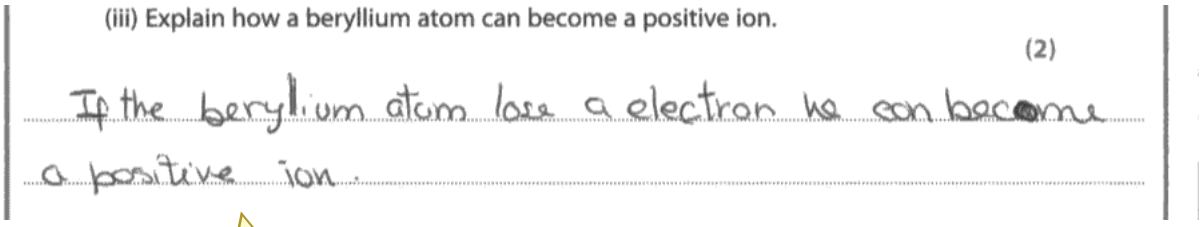
Examiner Comments

Candidate has the correct idea of charge transfer.

This response gained both marks.



ResultsPlus
Examiner Comments

Candidate states that beryllium must lose an electron.

Question 5 (b)

Many candidates were able to convey the idea that there is a fusing or joining but a significant number did not use the word nuclei and so did not gain the first mark point.

The second mark was often gained by a correct description of the product of fusion.

This was a typical one mark response.

(b) Nuclear fusion is one type of nuclear reaction.
Nuclear fusion reactions release energy in the Sun.

Describe what happens during nuclear fusion.

(2)

During Nuclear fusion 2 or more atoms join together.

ResultsPlus
Examiner Comments

Candidate has gained mark for atoms 'join together'

This response scored 2 marks.

(b) Nuclear fusion is one type of nuclear reaction.
Nuclear fusion reactions release energy in the Sun.

Describe what happens during nuclear fusion.

(2)

During nuclear fusion, 2 nuclei ~~join~~ join together to form a greater nucleus.

ResultsPlus
Examiner Comments

'nuclei' 'join together' scores both marks.

Question 5 (c)

There was a good range of marks gained by candidates for this question. However there were some candidates who made no attempt to answer it and left it blank. Of those who made an attempt, the majority of candidates did not include the use of a moderator in their answer. Many candidates did not include the need for containment of radioactive materials. The idea of control by control rods was more popular as a way of controlling the fission reaction. Although many provided diagrams these were often poorly labelled or showed the working of the generating section of power stations with little reference to the reactor. As in 5b candidates wrote vague answers with little reference to nuclei at all. Too many did not appreciate that neutrons caused nuclei to fission and sometimes mentioned protons, electrons or even atoms as the particle colliding with a uranium nucleus and initiating fission.

A typical response containing no rewardable material.

*(c) Nuclear fission is another type of nuclear reaction.
In some nuclear reactors, the controlled fission of uranium-235 (U-235) is used to release thermal energy.

Describe the process of fission and its control in a nuclear reactor.

You may draw a labelled diagram to help with your answer.

(6)

it is lots of little reactions that help to push the uranium-235 to go in to the nuclear reactor and help it to explode. to control reaction.

ResultsPlus
Examiner Comments

The candidate merely repears information from the question

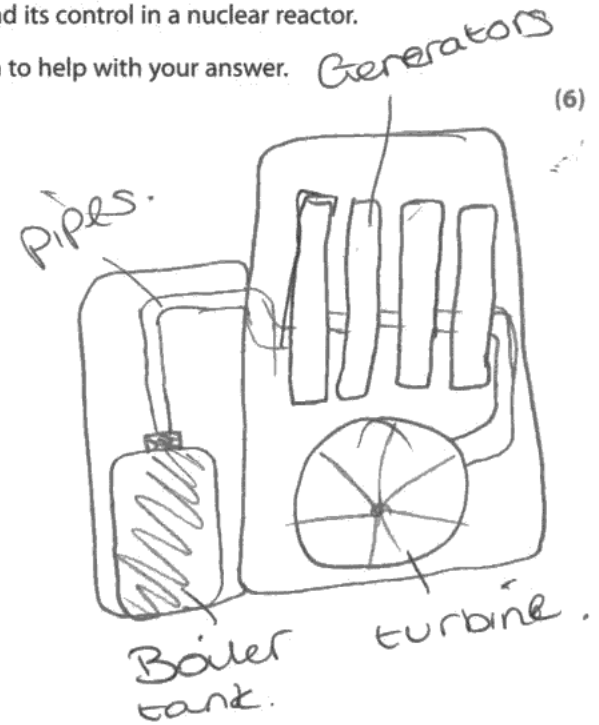
Another response with no rewardable material.

*(c) Nuclear fission is another type of nuclear reaction.
In some nuclear reactors, the controlled fission of uranium-235 (U-235) is used to release thermal energy.

Describe the process of fission and its control in a nuclear reactor.

You may draw a labelled diagram to help with your answer.

(6)



Water is boiled in the boiler tank until most is condensed and turned into steam. Once the steam is created, it goes through pipes past generators (that keep it running) and through the turbine which is turned into thermal energy through the generator and used for a variety of different uses.

ResultsPlus
Examiner Comments

Many candidates did not answer the question.

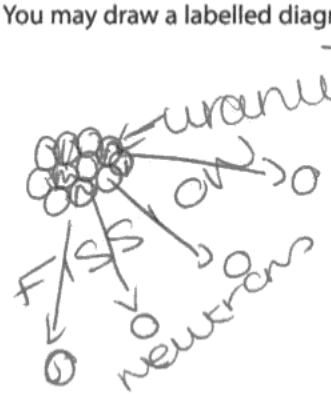
Enough for a level one answer.

*(c) Nuclear fission is another type of nuclear reaction.
In some nuclear reactors, the controlled fission of uranium-235 (U-235) is used to release thermal energy.

Describe the process of fission and its control in a nuclear reactor.

You may draw a labelled diagram to help with your answer.

(6)



thermal energy released.

Uranium - The particles start off fused together and seperate through fission. Neutrons are then released along with thermal energy.

ResultsPlus
Examiner Comments

2 marks awarded for a limited description.

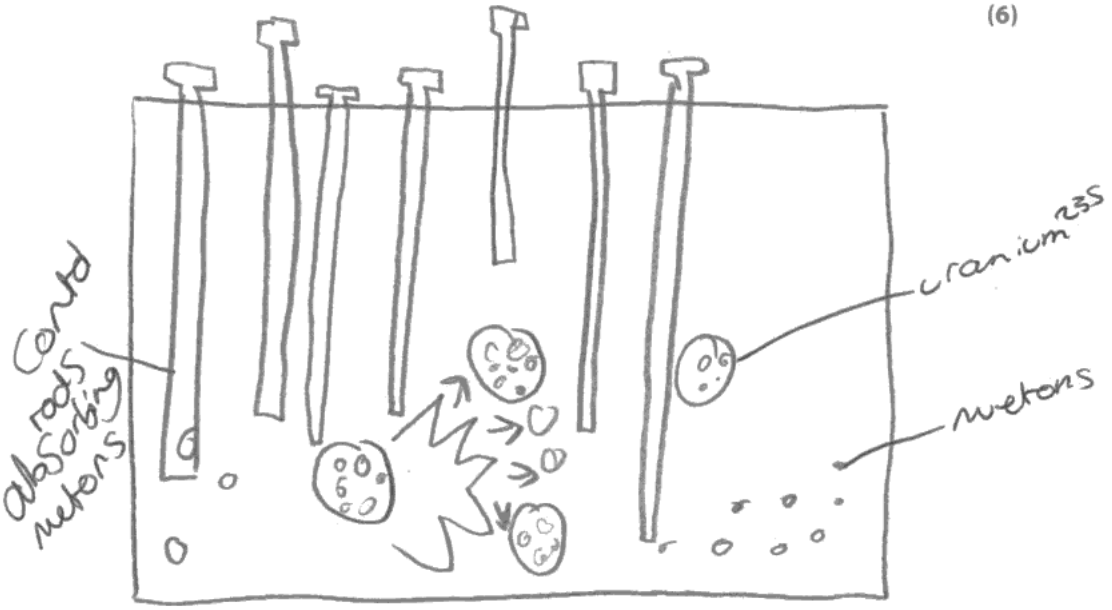
Enough for a level 3 answer.

*(c) Nuclear fission is another type of nuclear reaction.
In some nuclear reactors, the controlled fission of uranium-235 (U-235) is used to release thermal energy.

Describe the process of fission and its control in a nuclear reactor.

You may draw a labelled diagram to help with your answer.

(6)



Nuclear fission is when the uranium splits into two or more daughter nucleus and 2or more neutons are released. This reaction requires room temprature and room pressure, ~~B~~ Due to the release ~~the neutrons~~ of the neutons they bump into another uranium atom ~~and~~ and the process begins again. This is a chain reaction and can be come dangerous. It can be controlled by contol rods which are made from Boron which absorbs the extra neutrons and slows down the reaction to keep it safe-

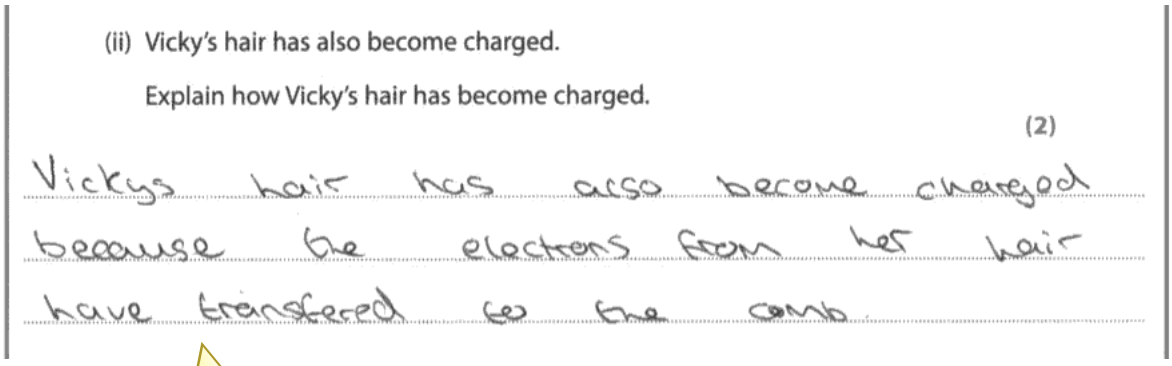
ResultsPlus
Examiner Comments

The response contains at least two sets of linked points about nuclear fusion. 6 marks awarded.

Question 6 (a) (ii)

Too few candidates mentioned friction or rubbing or that the hair would become positively charged. More referred to electron transfer but often in the wrong direction. It was worrying that some talked of positive electrons or of protons moving.

A common one mark response.



(ii) Vicky's hair has also become charged.

Explain how Vicky's hair has become charged.

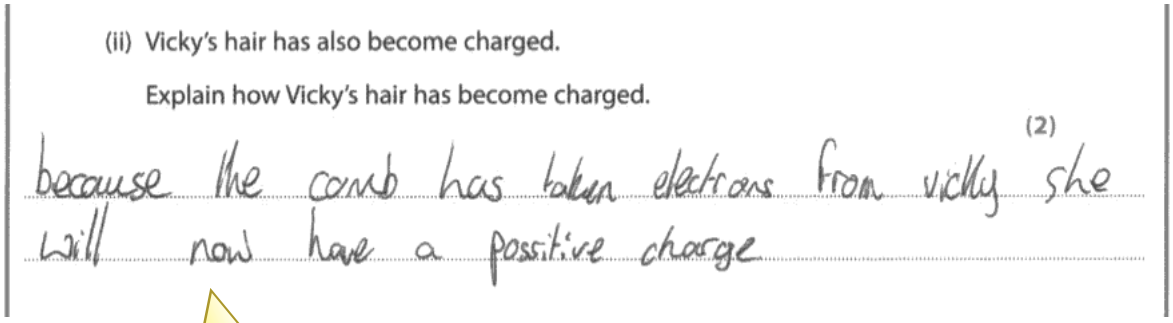
(2)

Vickys hair has also become charged because the electrons from her hair have transfered to the comb

ResultsPlus
Examiner Comments

This candidate has electrons moving in the correct direction and so matches the second mark point

One of the 26% scoring both marks.



(ii) Vicky's hair has also become charged.

Explain how Vicky's hair has become charged.

(2)

because the comb has taken electrons from vicky she will now have a possitive charge

ResultsPlus
Examiner Comments

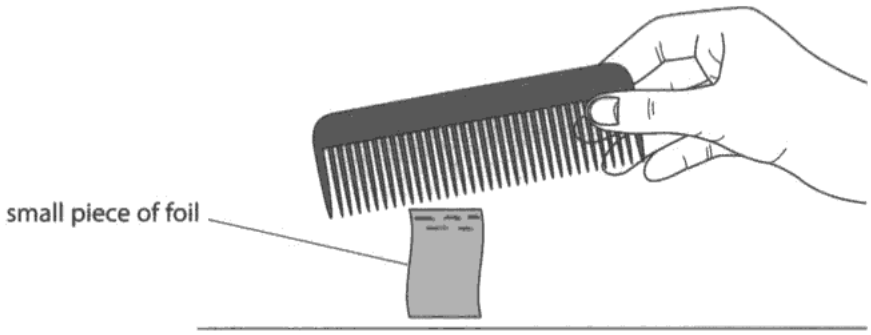
This candidate has the correctc direction of transfer of electrons and states the correct charge on the hair.

Question 6 (a) (iii)

Over 60% of candidates were not awarded the mark for this question. Of these, many thought that the whole section of foil was negatively charged or that the top was negative.

One of many incorrect responses.

(iii) Vicky holds the comb over a small piece of metal foil.
The foil jumps up and sticks to the comb.



Show on the diagram where the foil is negatively charged.

(1)

ResultsPlus
Examiner Comments

negative charges drawn in wrong place.

Question 6 (b)

Many candidates assumed that both pieces of metal had the same charge and repelled. Some said that metal was a conductor and then often went on to say that electrons did not move through metals or that they did not conduct static electricity. A number stated that a metal was not a conductor.

A typically confused response.

(b) Vicky combs her hair with a metal comb.
Then she tries to pick up some small pieces of metal foil with the comb.
The metal comb does not pick up any pieces of metal foil.

Explain why the metal foil is not picked up by the comb.

(2)

Because both are metal, so they will repell eachother.

ResultsPlus
Examiner Comments

Many candidates stated that the two metals would repel. Possibly some confusion with magnets?

One of the 24% scoring one mark

(b) Vicky combs her hair with a metal comb.
Then she tries to pick up some small pieces of metal foil with the comb.
The metal comb does not pick up any pieces of metal foil.

Explain why the metal foil is not picked up by the comb.

(2)

Because it is not charged it will not pick the peces of foil up.

ResultsPlus
Examiner Comments

A number of candidates scored a mark for stating that the metal comb would be uncharged.

This response also indicates candidates' confusion.

(b) Vicky combs her hair with a metal comb.
Then she tries to pick up some small pieces of metal foil with the comb.
The metal comb does not pick up any pieces of metal foil.

Explain why the metal foil is not picked up by the comb.

(2)

The metal comb will have the same charge as the foil so they will repell.

ResultsPlus
Examiner Comments

Another very common incorrect response. Candidates seemed to think that if the metal objects did not attract they must repel.

Question 6 (c)

This question was answered better than 5(c). Again, there was a good range of marks gained by candidates for this question. Most candidates made an attempt to answer it. Of those who made an attempt, the majority of candidates included the attraction of charges in their answer, fewer included points about the repulsion of charges. Good responses stated that the paint particles would repel from each other and be attracted to the mirror but too many did not then compare it to the workings of an uncharged sprayer.

No rewardable material.

Explain the benefits of using this sprayer compared with one that does not charge the paint.

(6)

They are negatively charged so they wont react to the metal they are being sprayed onto, whereas if they had no charge they still could react to the metal, or even the air, and destroy the object trying to be painted.

ResultsPlus
Examiner Comments

A confused response but, not far away from scoring some marks.

A level one response that gained 2 marks.

Explain the benefits of using this sprayer compared with one that does not charge the paint.

(6)

this spras on and covers more of the metal from where as one thats does Not charge the Paint will drip and Not work as good as the spraying Paint one.

ResultsPlus
Examiner Comments

A limited description containing one or two points that are not linked.

A level two answer gaining 4 marks.

Explain the benefits of using this sprayer compared with one that does not charge the paint.

(6)

Because the paint is negatively charged before leaving the sprayer it helps it stick to the object that it is being sprayed onto because the opposite charges attract.

ResultsPlus
Examiner Comments

The candidate has linked two points. the negatively charged paint is attracted to the (induced) positive charge on the mirror.

A clear level three response awarded 6 marks.

Explain the benefits of using this sprayer compared with one that does not charge the paint.

(6)

When the paint leaves the Sprayer they repel from each other this is because the Paint is given the Same charge ([redacted] negative). This is So the paint Spreads out to cover a greate surface. When they reach the mirror which is positively charged the Paint is attracted to the mirror meaning the paint will coat the mirror. If you Spay a mirror with non-charged Paint the paint will not be attracted and will only Coat Some of the mirror and Some of the paint will not go on the mirror.

ResultsPlus
Examiner Comments

The candidate links the negatively charged paint droplets repelling so they spread out and improve coverage.

There is also a link between unlike charges attracting and finally, there is a comment about the uncharged paint.

Paper Summary

The paper allowed candidates of all abilities to access marks in all questions. Weaker candidates found difficulty with describe, explain and discuss questions, and with some of the calculations.

In order to improve their performance, candidates should:

- memorise the basic facts which are stated in the specification
- use technical terms wherever possible in descriptions and explanations
- give a reason as well as a statement when answering an 'explain' question
- practise applying their knowledge to new situations by attempting questions in support materials or exam papers
- read the question carefully and underline the key words

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