Examiners' Report
June 2012

GCSE Physics 5PH1F 01

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June 2012

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Introduction

This examination set out to allow candidates to demonstrate that they can accurately recall concepts and phenomena in physics and can communicate their understanding using both qualitative and quantitative models. The broad base of ideas used in the specification links the discoveries of physicists both past and present to benefits that they have brought to society and to our understanding of the Universe.

The assessment was through multiple choice questions, short answers, extended writing, calculations and data analysis. Candidates needed to be familiar with the use of equations, be able to express their ideas clearly and concisely and interpret scientific data which was presented in a variety of ways.

The work produced for the examination showed that candidates were most confident in expressing themselves when they did not have to apply their knowledge to a new situation. Many candidates were able to describe the life cycle of a main sequence star correctly and with sufficient detail to merit the award of six marks. However, when it came to applying knowledge of forms of energy and their transfer to what was possibly a new situation then candidates were less successful.

Candidates also needed to use scientific terms when describing scientific phenomena, the use of general terms will not yield marks. For waves it is wavelength, frequency and amplitude. For electricity, the differences between current, charge and voltage must be understood.

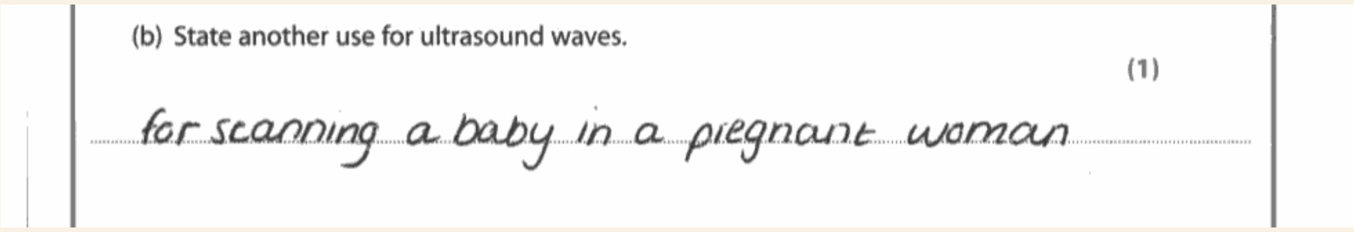
It is important that candidates learn to use labelled diagrams to add to their work particularly where accurate description may be difficult. This was used very successfully in many answers describing the life cycle of our Sun. The information provided by diagrams also needs to be appreciated, such as the arrows on light rays indicating the direction of the light.

The formulae sheet at the front of the examination paper should be familiar to candidates and used on a regular basis throughout the course. Full marks were given to correct answers to calculations, with or without working, unless candidates were asked to show that an answer is correct. However, writing the correct formula would enable candidates to substitute in an equation even if they were unable to make further progress. Candidates should be reminded that having a calculator is a prequiste for this paper.

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 which required more complex responses from candidates.

Question 1 (b)

Most candidates were able to give a use for ultrasound. The most common answers were ultrasound scanning, sonar ranging and animal communication. There were also the popular misconceptions such as communications between elephants, which is infrasound and dispersing groups of young people, for which high frequency sound is used. The confusion between ultrasound and ultraviolet was apparent when sun beds were cited as a possible use.



(b) State another use for ultrasound waves.

(1)

for scanning a baby in a pregnant woman

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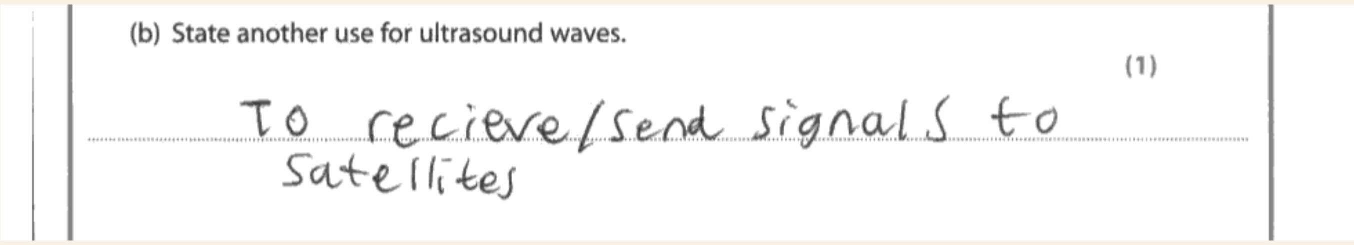
Examiner Comments

The answer given most often was foetal scanning, expressed in various different ways.

ResultsPlus

Examiner Tip

Scanning is a correct use of ultrasound but 'looking at an unborn baby' is not correct as it is information from the ultrasound scan which has been converted to the image on a screen that can be viewed.



(b) State another use for ultrasound waves.

(1)

To recieve/send signals to satellites

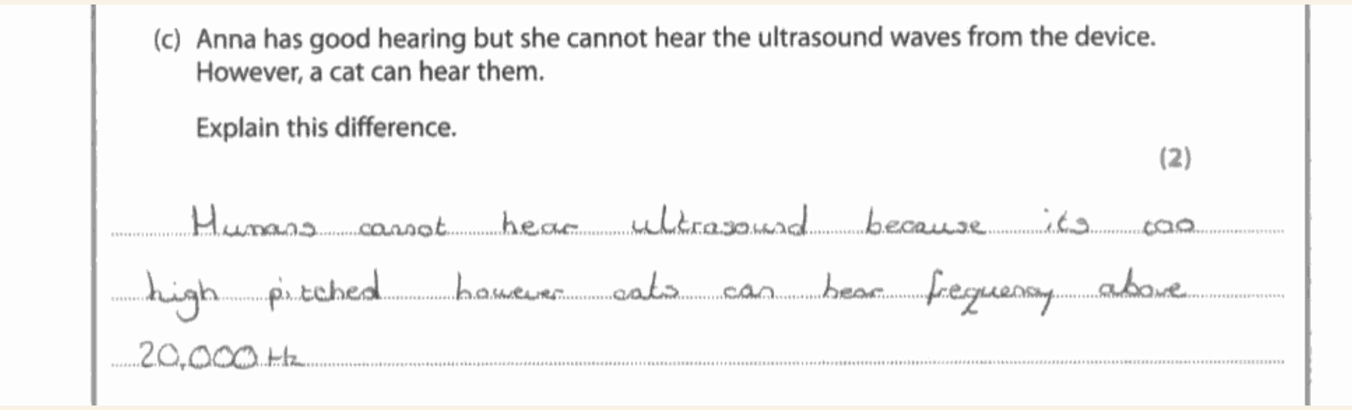
ResultsPlus

Examiner Comments

This example illustrated the confusion in the minds of candidates between ultrasound and waves of the electromagnetic spectrum.

Question 1 (c)

This answer required the correct scientific terms of frequency or pitch to be used. Sensitive, better or a different kind of hearing were not sufficiently precise terms for a mark to be awarded.



(c) Anna has good hearing but she cannot hear the ultrasound waves from the device. However, a cat can hear them.

Explain this difference.

(2)

Humans cannot hear ultrasound because its too high pitched however cats can hear frequency above 20,000 Hz

ResultsPlus

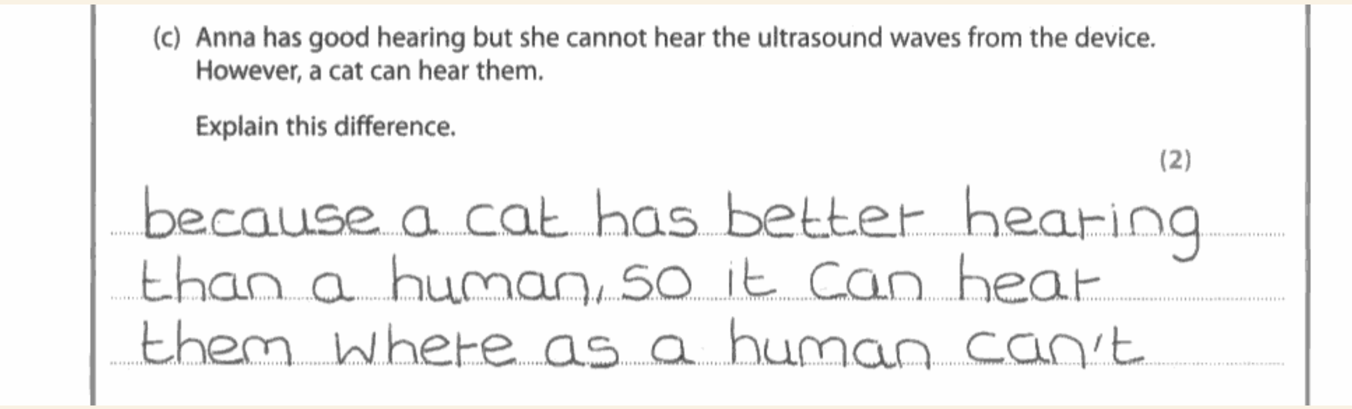
Examiner Comments

The use of pitch, frequency or hertz would have given the first mark. The fact that the ultrasound is too high for humans to hear gave the second mark.

ResultsPlus

Examiner Tip

Always use scientific terms in explanations rather than general words.



(c) Anna has good hearing but she cannot hear the ultrasound waves from the device. However, a cat can hear them.

Explain this difference.

(2)

because a cat has better hearing than a human, so it can hear them where as a human can't

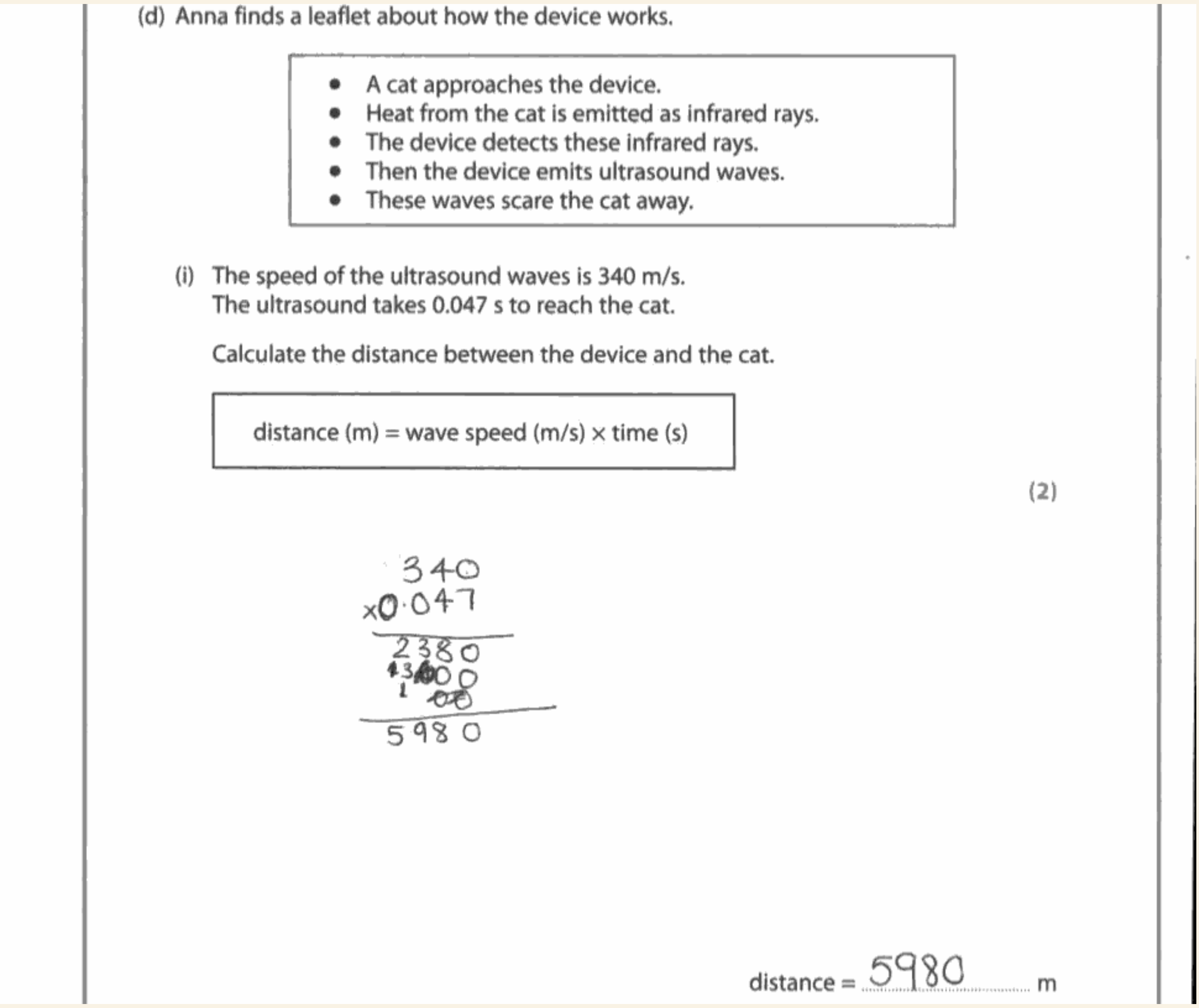
ResultsPlus

Examiner Comments

No marks were awarded as 'better hearing' is not a scientific reason for the cats to be able to hear the ultrasound.

Question 1 (d) (i)

The majority of candidates gave the correct answer with no working shown.



(d) Anna finds a leaflet about how the device works.

- A cat approaches the device.
- Heat from the cat is emitted as infrared rays.
- The device detects these infrared rays.
- Then the device emits ultrasound waves.
- These waves scare the cat away.

(i) The speed of the ultrasound waves is 340 m/s.
The ultrasound takes 0.047 s to reach the cat.

Calculate the distance between the device and the cat.

distance (m) = wave speed (m/s) × time (s)

(2)

340
×0·047
2380
13600
1 ~~00~~
5980

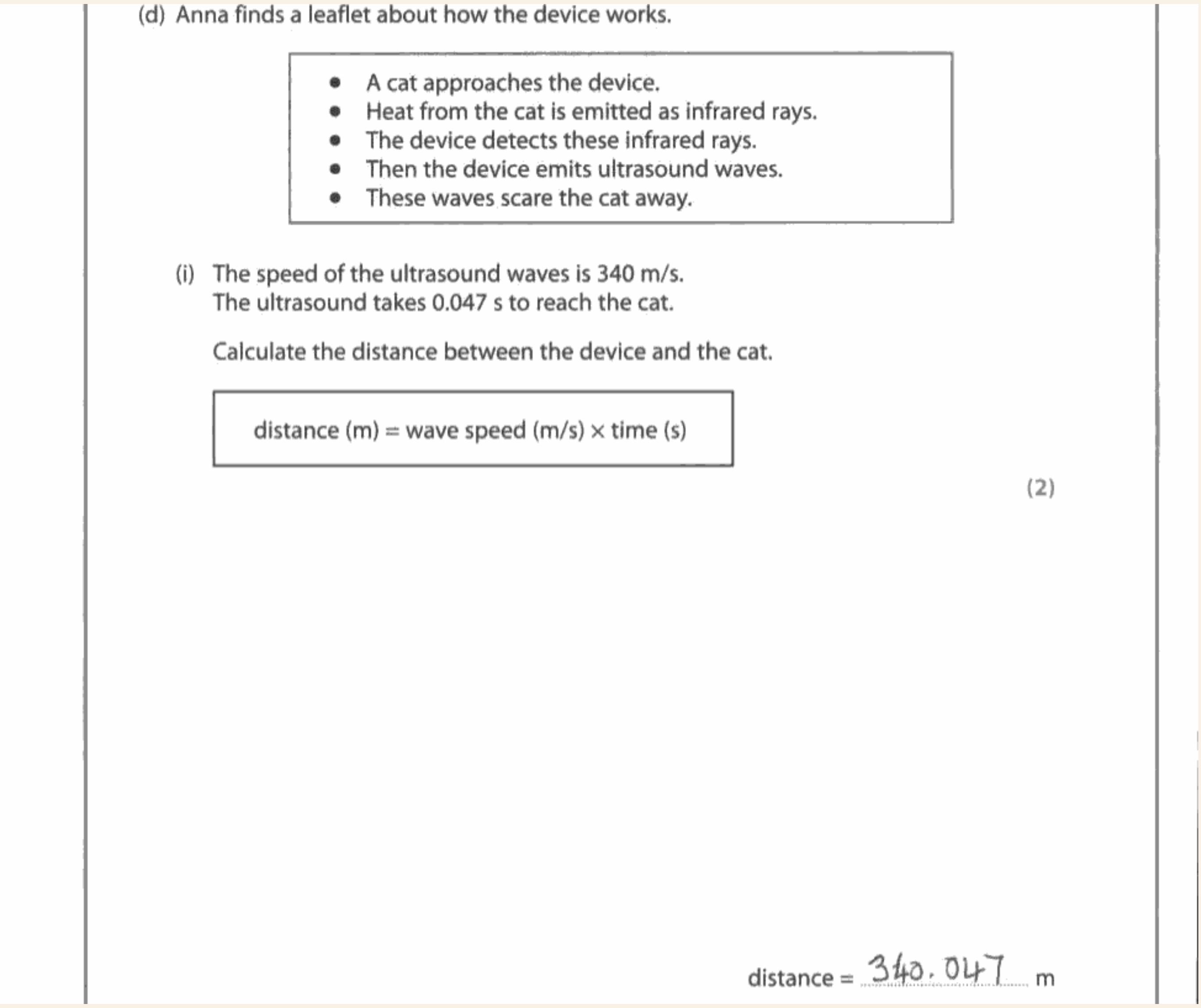
distance = 5980 m

ResultsPlus
Examiner Comments

This candidate scored one mark for correct substitution into the equation.

ResultsPlus
Examiner Tip

Every candidate should have a calculator.



(d) Anna finds a leaflet about how the device works.

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The ultrasound takes 0.047 s to reach the cat.

Calculate the distance between the device and the cat.

distance (m) = wave speed (m/s) × time (s)

(2)

distance = 340.047 m

ResultsPlus

Examiner Comments

An incorrect answer was given but no working, so no marks awarded.

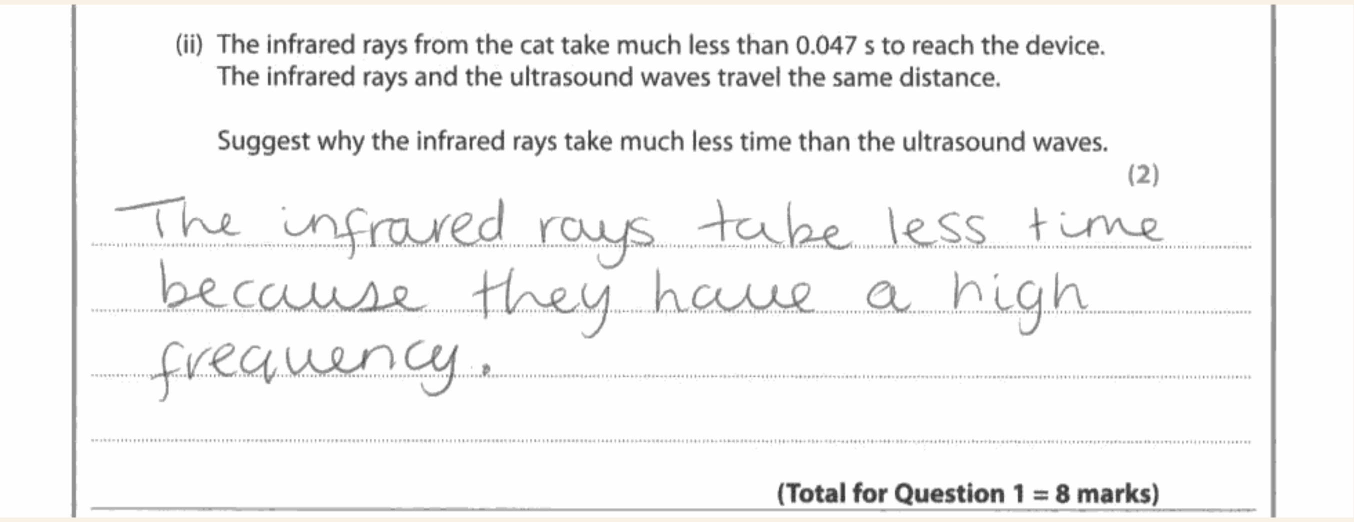
ResultsPlus

Examiner Tip

Show the correct substitution into the equation to gain one mark even if the final answer is incorrect.

Question 1 (d) (ii)

Candidates were expected to understand that the important characteristic of a wave to be used was speed. Recognising this would have gained one mark. Knowing that infrared radiation travelled faster than ultrasound gained the second mark.



(ii) The infrared rays from the cat take much less than 0.047 s to reach the device.
The infrared rays and the ultrasound waves travel the same distance.

Suggest why the infrared rays take much less time than the ultrasound waves.

(2)

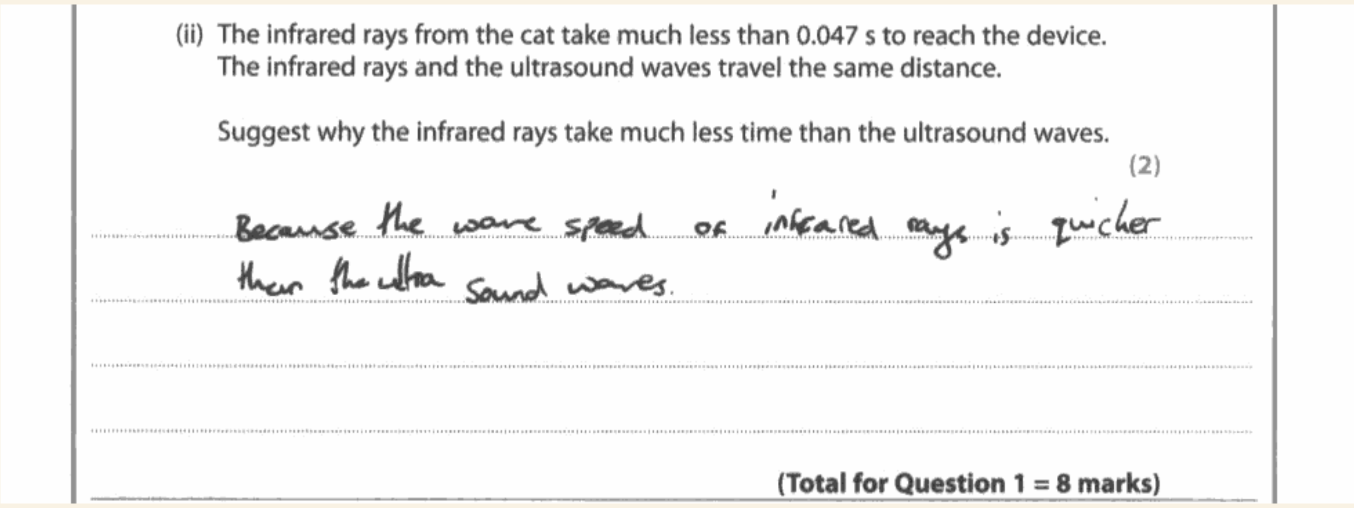
The infrared rays take less time because they have a high frequency.

(Total for Question 1 = 8 marks)

ResultsPlus

Examiner Comments

This answer illustrated the incorrect selection of the wave property and was not awarded a mark.



(ii) The infrared rays from the cat take much less than 0.047 s to reach the device.
The infrared rays and the ultrasound waves travel the same distance.

Suggest why the infrared rays take much less time than the ultrasound waves.

(2)

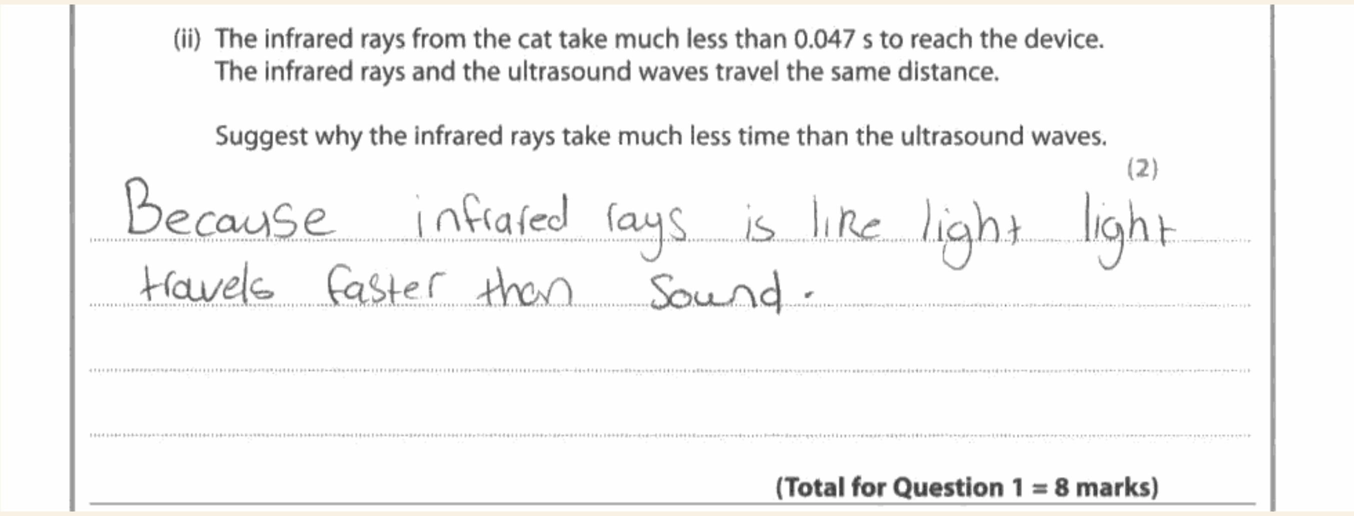
Because the wave speed of infrared rays is quicker than the ultra sound waves.

(Total for Question 1 = 8 marks)

ResultsPlus

Examiner Comments

This indicated wave speed and that infrared travels more quickly than ultrasound. Two marks were awarded.



(ii) The infrared rays from the cat take much less than 0.047 s to reach the device.
The infrared rays and the ultrasound waves travel the same distance.

Suggest why the infrared rays take much less time than the ultrasound waves.

(2)

Because infrared rays is like light light travels faster than Sound.

(Total for Question 1 = 8 marks)

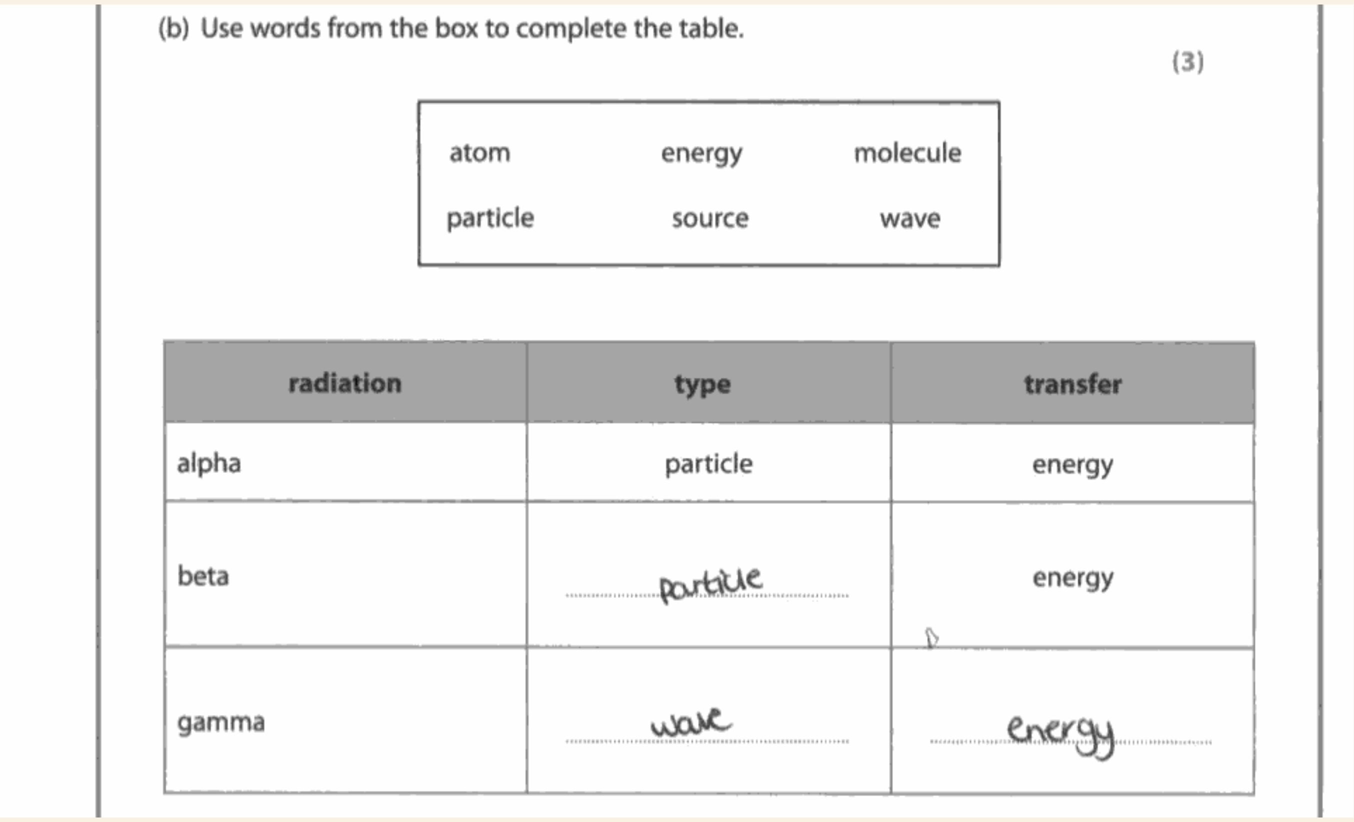
ResultsPlus

Examiner Comments

The correct comparison of the speed of light and sound was also awarded two marks.

Question 2 (b)

Surprisingly few candidates managed to get the three answers correct although the fact that ionising radiations include alpha and beta particles and gamma rays and that they all transfer energy was directly taken from the specification.



(b) Use words from the box to complete the table.

(3)

atom	energy	molecule
particle	source	wave

radiation	type	transfer
alpha	particle	energy
beta	particle	energy
gamma	wave	energy

ResultsPlus

Examiner Comments

This was one of the few examples which gave three correct answers.

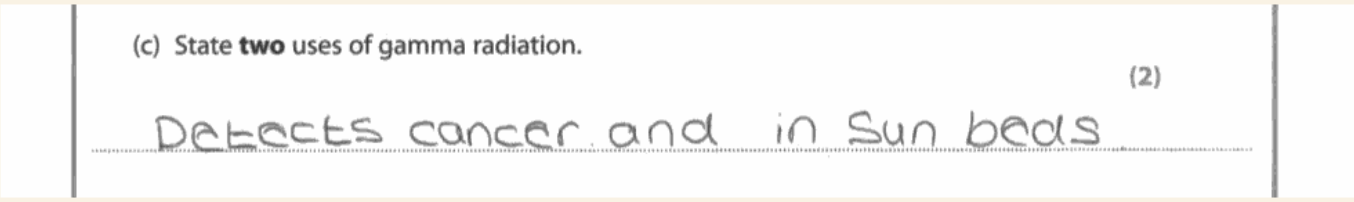
ResultsPlus

Examiner Tip

The ability to recall scientific information and ideas is an essential part of communication skills for 'How Science Works'.

Question 2 (c)

Most candidates were able to give one correct use of gamma radiation but there was still confusion between the uses of gamma with other types of radiation. The main correct uses quoted were sterilisation of food or medical equipment and detection or treatment of cancers.



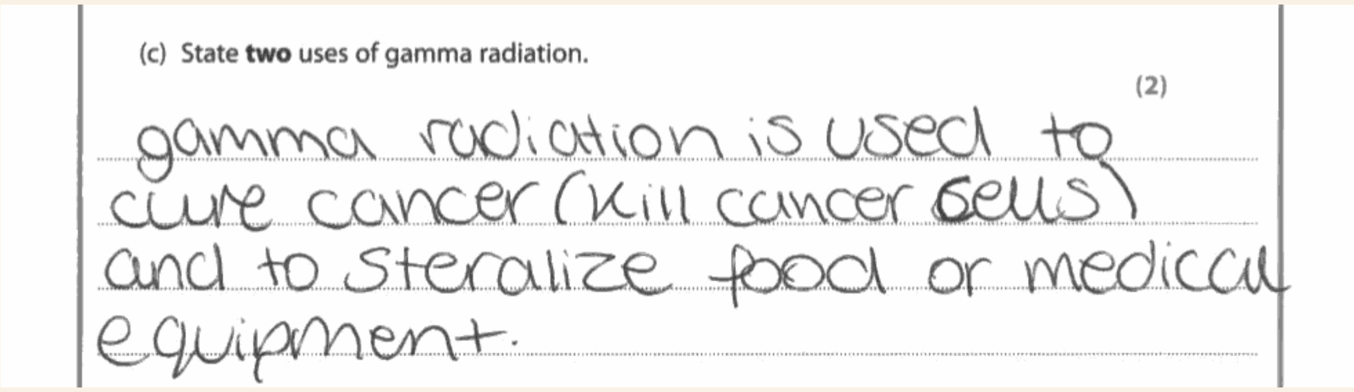
(c) State **two** uses of gamma radiation.

(2)

Detects cancer and in Sun beds

ResultsPlus
Examiner Comments

The candidate did not appreciate the dangers associated with gamma rays to suggest sun beds as a possible use.



(c) State **two** uses of gamma radiation.

(2)

gamma radiation is used to cure cancer (kill cancer cells) and to steralize food or medical equipment.

ResultsPlus
Examiner Comments

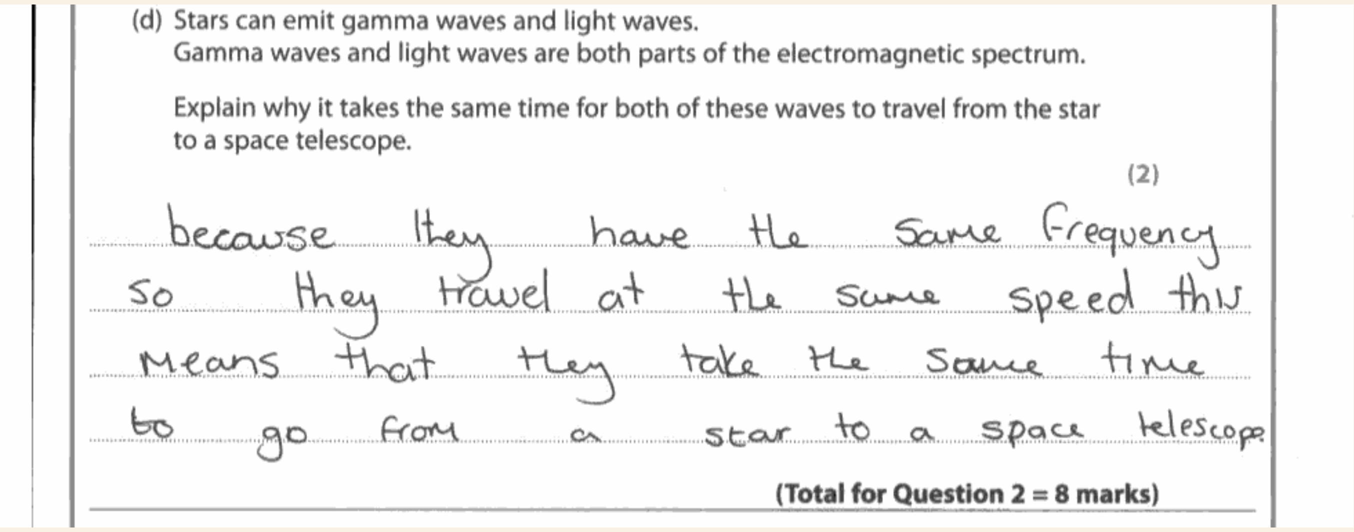
This answer contained all the information necessary to get two marks.

ResultsPlus
Examiner Tip

If a question has 2 marks available, two points must be made in your answer.

Question 2 (d)

This question was set for candidates to show that they knew that electromagnetic waves travel at the same speed in a vacuum. However either candidates did not realise that the telescope was in space or they did not appreciate the significance of the vacuum and that space is a vacuum. Many candidates said the waves travelled at the same speed which gave one mark.



(d) Stars can emit gamma waves and light waves.
Gamma waves and light waves are both parts of the electromagnetic spectrum.

Explain why it takes the same time for both of these waves to travel from the star to a space telescope.

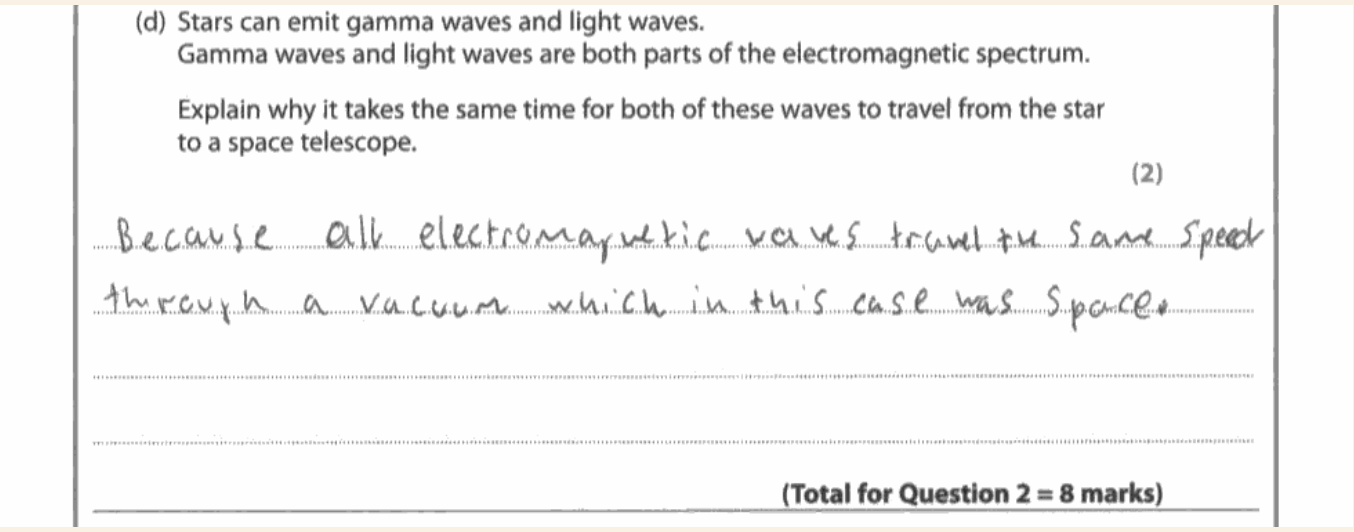
(2)

because they have the same frequency so they travel at the same speed this means that they take the same time to go from a star to a space telescope

(Total for Question 2 = 8 marks)

ResultsPlus
Examiner Comments

Mention of frequency or wavelength, if correct or incorrect, were ignored and travelling at the same speed received one mark.



(d) Stars can emit gamma waves and light waves.
Gamma waves and light waves are both parts of the electromagnetic spectrum.

Explain why it takes the same time for both of these waves to travel from the star to a space telescope.

(2)

Because all electromagnetic waves travel the same speed through a vacuum which in this case was space.

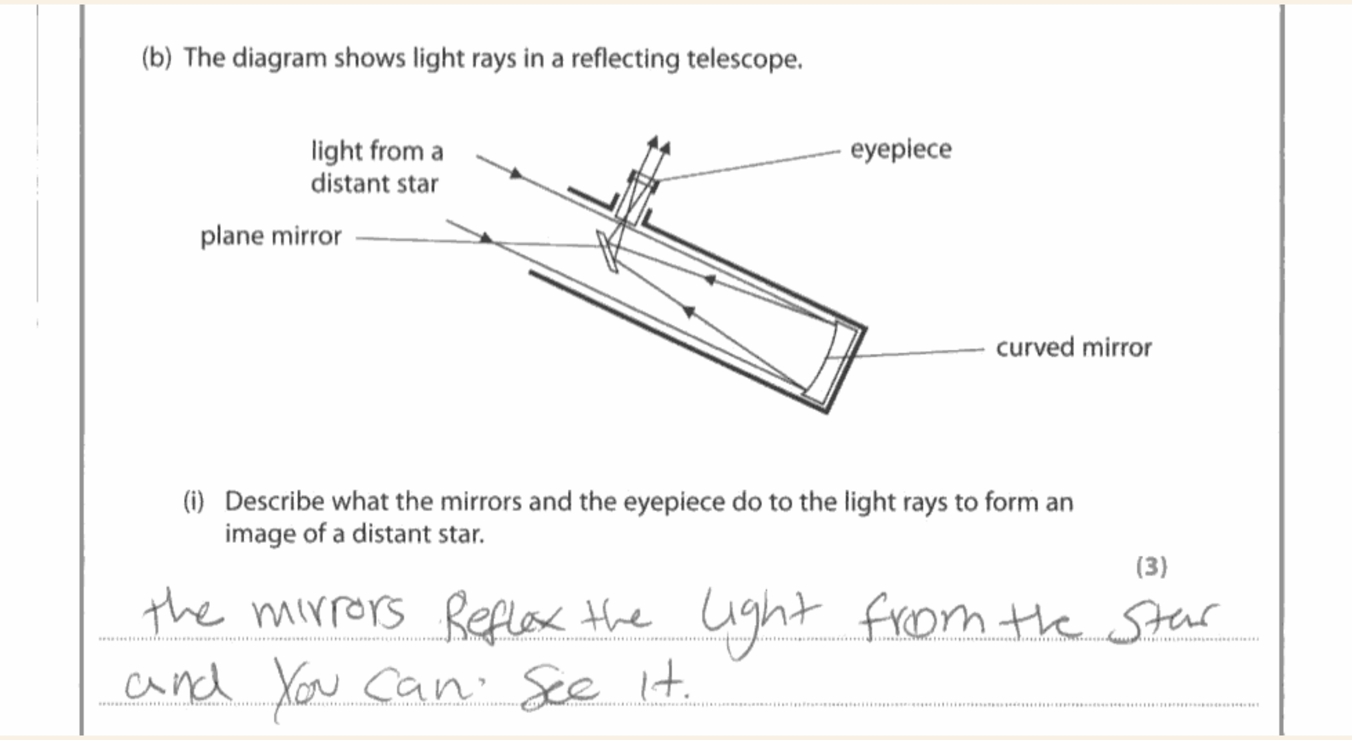
(Total for Question 2 = 8 marks)

ResultsPlus
Examiner Comments

The example gave all the electromagnetic waves travelling at the same speed in a vacuum and explained that space is a vacuum.

Question 3 (b) (i)

Candidates needed to be able to describe the effects that allow the image of a distant object to be seen through the eyepiece of a telescope. Most candidates recognised reflection of light by a mirror by using the diagram, but the purpose of the arrows to indicate the direction of travel of the light was not always apparent to many candidates. Magnification of the image by the eyepiece was a common answer. However, few candidates realised that a real image was formed where the rays cross or that the image was in focus and inverted.



(b) The diagram shows light rays in a reflecting telescope.

(i) Describe what the mirrors and the eyepiece do to the light rays to form an image of a distant star.

(3)

the mirrors Reflax the light from the Star and You can' See it.

ResultsPlus

Examiner Comments

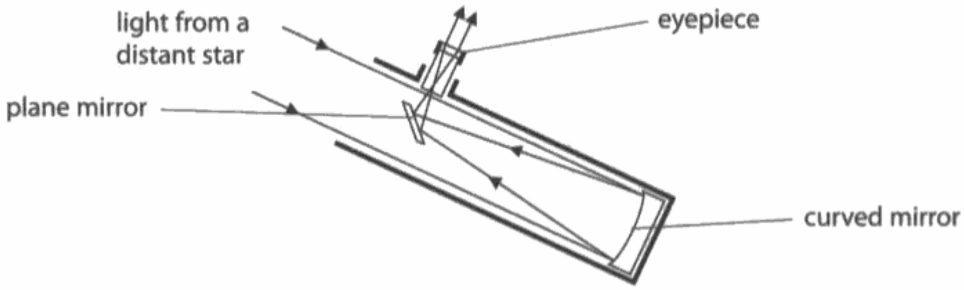
This answer gained a mark, even though 'reflex' was used instead of reflects, as the meaning is apparent.

ResultsPlus

Examiner Tip

Candidate should learn the correct spelling of scientific words.

(b) The diagram shows light rays in a reflecting telescope.



(i) Describe what the mirrors and the eyepiece do to the light rays to form an image of a distant star.

(3)

The mirrors and the eyepiece are all placed in specific positions. This is so that once the visable light of a planet, Star, moon, etc have been located the Mirrors and eyepiece ~~can~~ are positioned just right for people to detect what has been located.

ResultsPlus

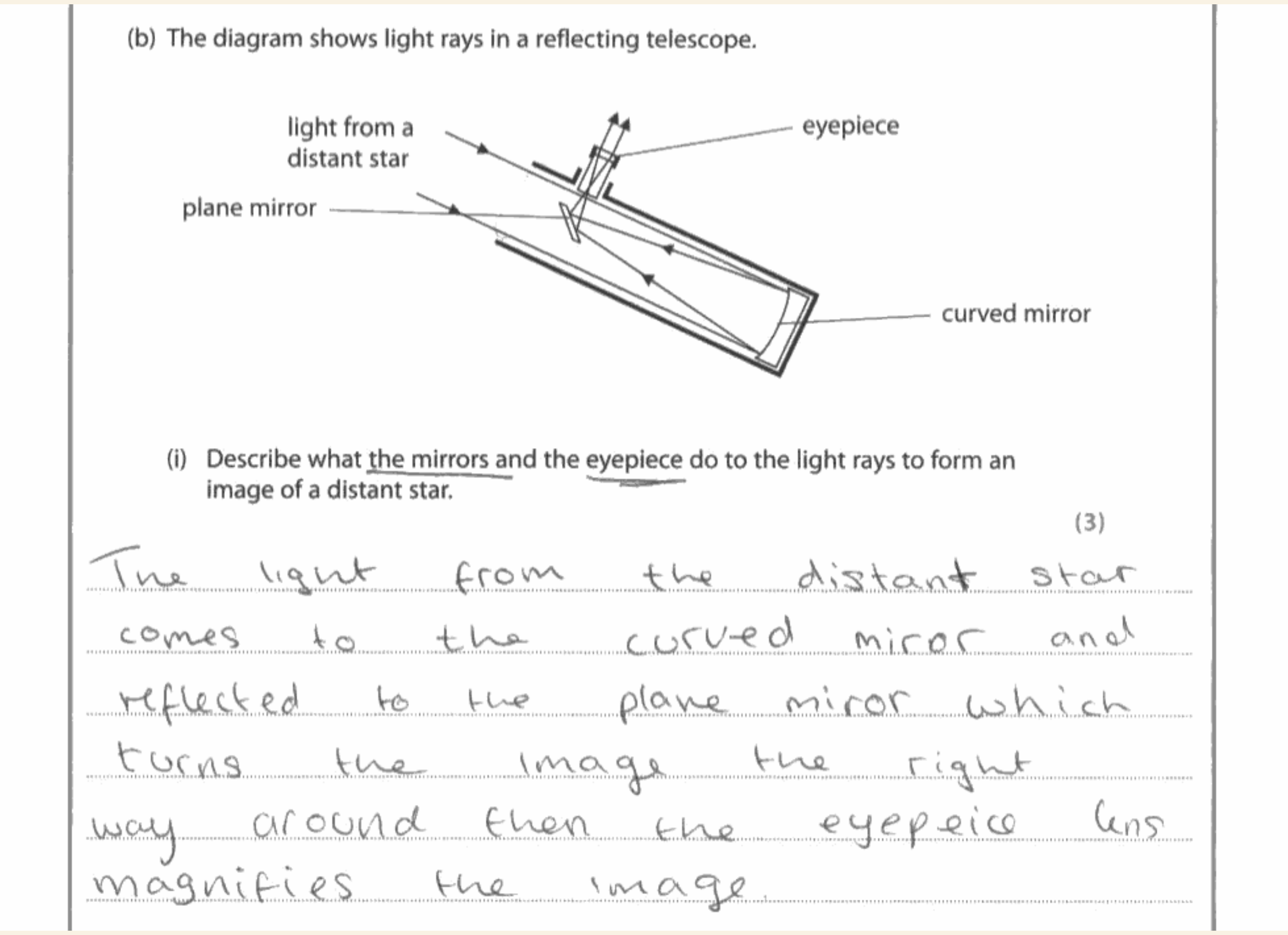
Examiner Comments

This example contained no science and was not awarded any marks.

ResultsPlus

Examiner Tip

Use the information that is shown on the diagram. The mirror reflects the light and the eyepiece refracts the light. Without knowing anything about the image this would then gain two marks.



(b) The diagram shows light rays in a reflecting telescope.

(i) Describe what the mirrors and the eyepiece do to the light rays to form an image of a distant star.

(3)

The light from the distant star comes to the curved miror and reflected to the plane miror which turns the image the right way around then the eyepeice lens magnifies the image.

ResultsPlus

Examiner Comments

This example showed that information from the diagram was used and showed a knowledge of the effect that mirrors and a convex lens have on the image produced.

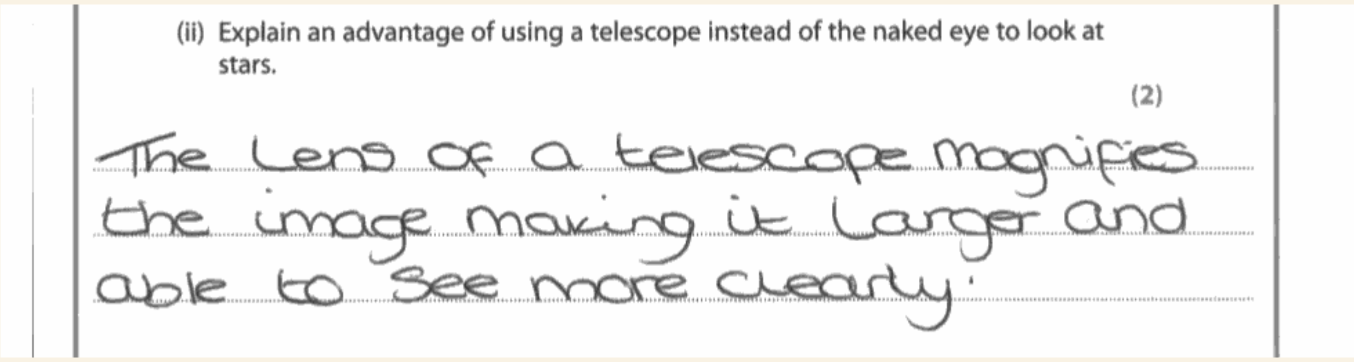
ResultsPlus

Examiner Tip

Make full use of ray diagrams to understand the behaviour of mirrors and lenses.

Question 3 (b) (ii)

This question was answered well with most candidates giving two advantages of using a telescope such as stars can be seen ’magnified and in more detail' or 'further away and clearer'.



(ii) Explain an advantage of using a telescope instead of the naked eye to look at stars.

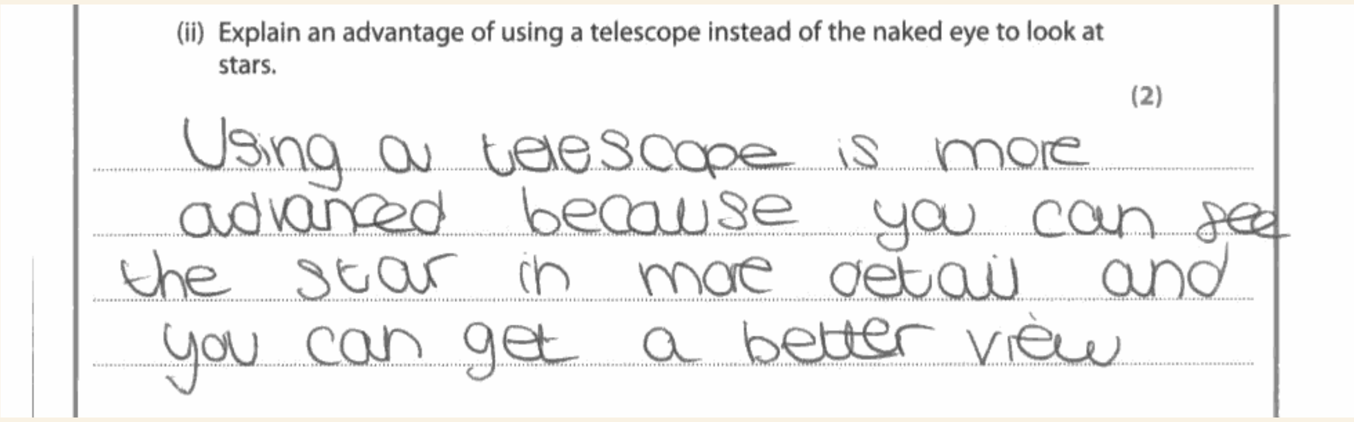
(2)

The Lens of a telescope magnifies the image making it Larger and able to See more clearly.

ResultsPlus

Examiner Comments

The correct answer given so gained two marks.



(ii) Explain an advantage of using a telescope instead of the naked eye to look at stars.

(2)

Using a telescope is more advanced because you can see the star in more detail and you can get a better view

ResultsPlus

Examiner Comments

'More detail' and 'better ' are the same thing and only one mark was awarded.

ResultsPlus

Examiner Tip

If there are two marks to be obtained make sure that two different pieces of information are given.

Question 3 (c) (i)

Transverse and mechanical were the only acceptable answers.

Many other waves which were transverse were given as the answer, seismic (S) waves were particularly popular but not correct in this case.

(i) State the name of this type of wave.

(1)

Radio

ResultsPlus

Examiner Comments

This answer gave the name of a wave that was transverse but does not give the name of the wave shown in the diagram.

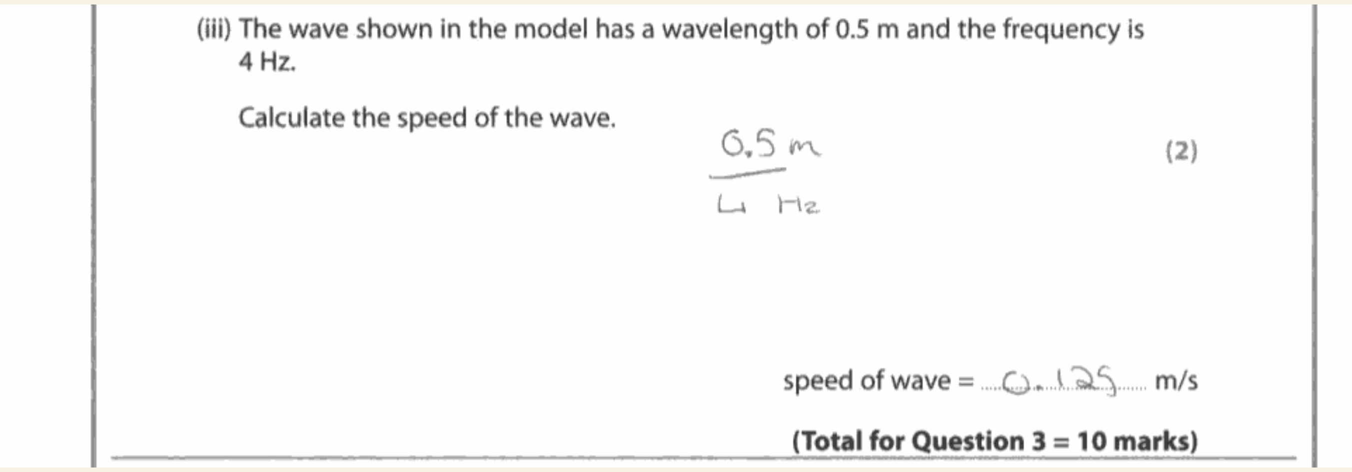
ResultsPlus

Examiner Tip

Make sure the answer given is to the question that is asked.

Question 3 (c) (iii)

This question was generally answered correctly with many candidates not showing any working. However, for those that could not decide whether to multiply or divide, writing down the equation from page 2 of the examination paper may have helped.



(iii) The wave shown in the model has a wavelength of 0.5 m and the frequency is 4 Hz.

Calculate the speed of the wave.

(2)

$\frac{0.5\ m}{4\ Hz}$

speed of wave = 0.125 m/s

(Total for Question 3 = 10 marks)

ResultsPlus

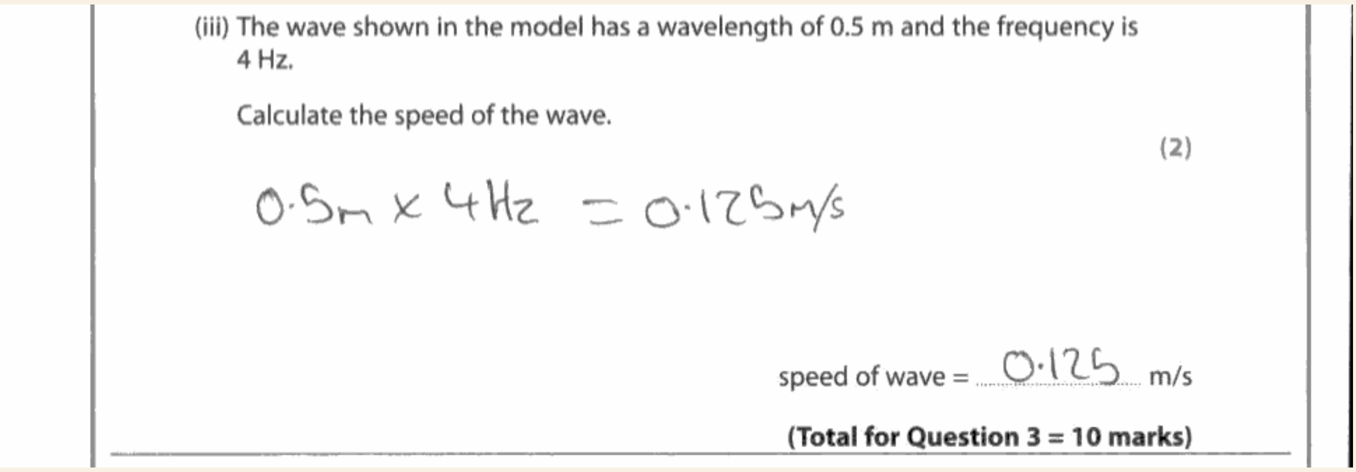
Examiner Comments

This example showed the values given used incorrectly and no marks were given.

ResultsPlus

Examiner Tip

Write down the correct equation and substitute the values correctly and this will gain one mark even if the answer is not correct.`



(iii) The wave shown in the model has a wavelength of 0.5 m and the frequency is 4 Hz.

Calculate the speed of the wave.

(2)

0·5m × 4Hz = 0·125m/s

speed of wave = 0·125 m/s

(Total for Question 3 = 10 marks)

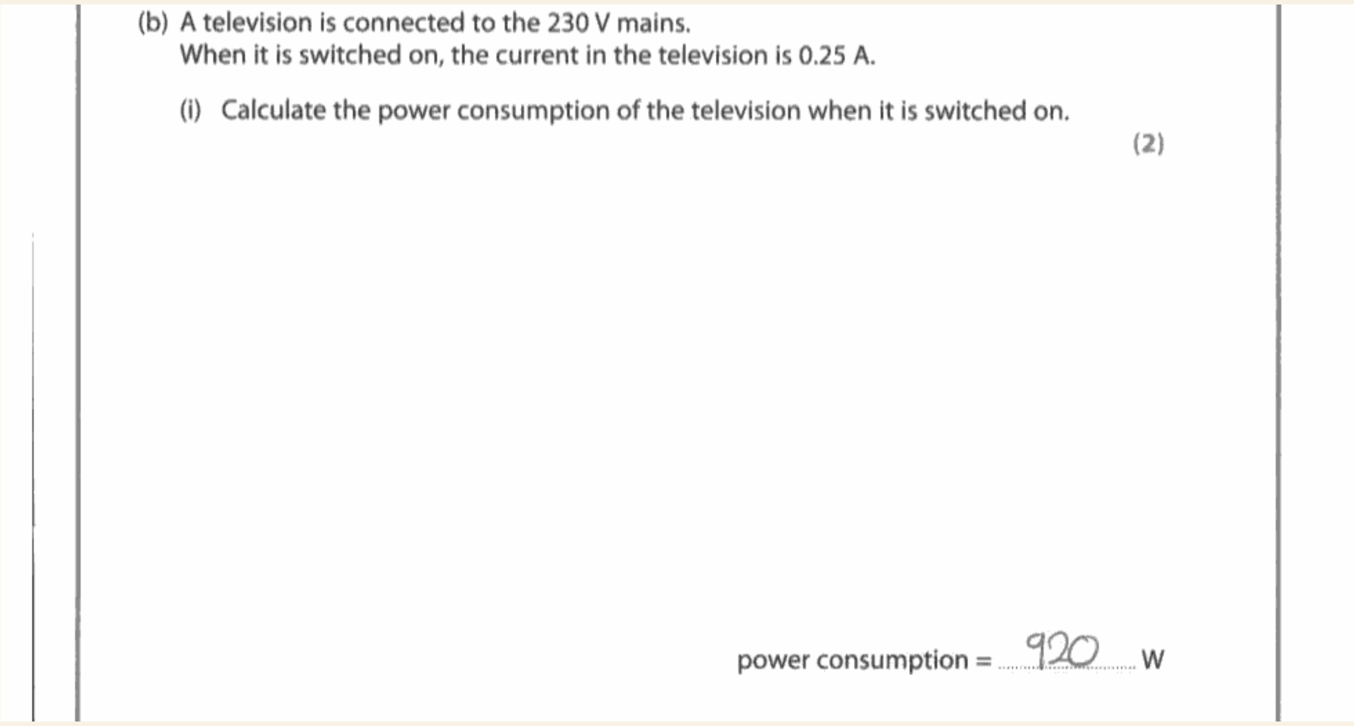
ResultsPlus

Examiner Comments

This example gained one mark for the correct substitution even though the equation was not written down.

Question 4 (b) (i)

This calculation was found challenging by many. Candidates needed to know that voltage is synonymous with potential difference otherwise the equation to use may not be apparent, even though it was given on page two of the examination paper. Multiplying by 0.25 also presented problems to those without calculators.



(b) A television is connected to the 230 V mains.
When it is switched on, the current in the television is 0.25 A.

(i) Calculate the power consumption of the television when it is switched on.
(2)

power consumption = 920 W

ResultsPlus
Examiner Comments

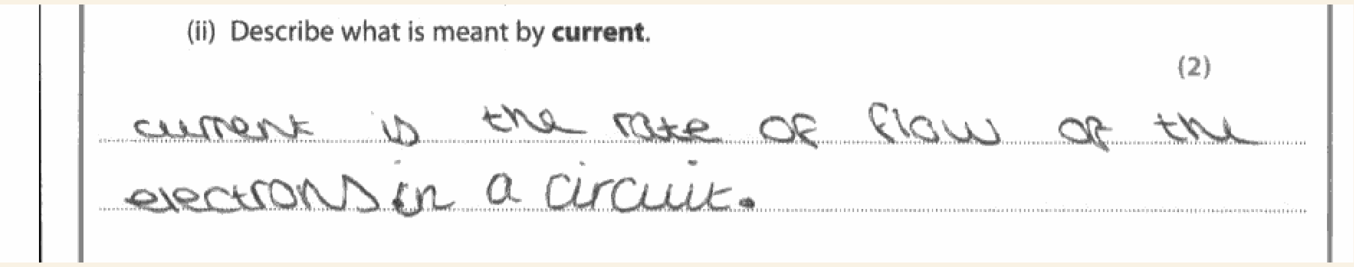
Finding the correct equation should have led the candidate to multiply and not divide the 230 V and 0.25 A.

ResultsPlus
Examiner Tip

Make use of the equations given at the front of the examination paper.

Question 4 (b) (ii)

Many candidates knew that a current was a flow of something, electricity being most often chosen. However the correct statement, that current is the rate of flow of charge was rarely seen even though it is given in the specification. This is an example of the description of a physical quantity which needs to be precise in order to gain full marks.



(ii) Describe what is meant by **current**.

(2)

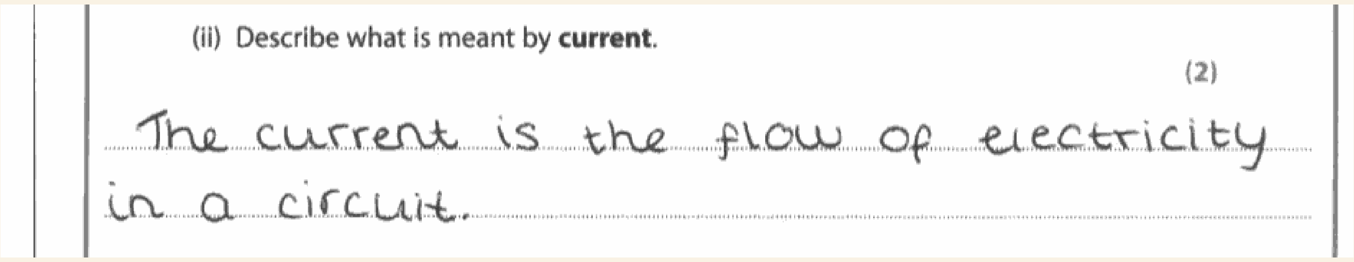
current is the rate of flow of the electrons in a circuit.

ResultsPlus
Examiner Comments

This type of answer was rarely seen. Electrons were allowed as equivalent to charge.

ResultsPlus
Examiner Tip

Precise descriptions of electrical quantities needs to be learned.



(ii) Describe what is meant by **current**.

(2)

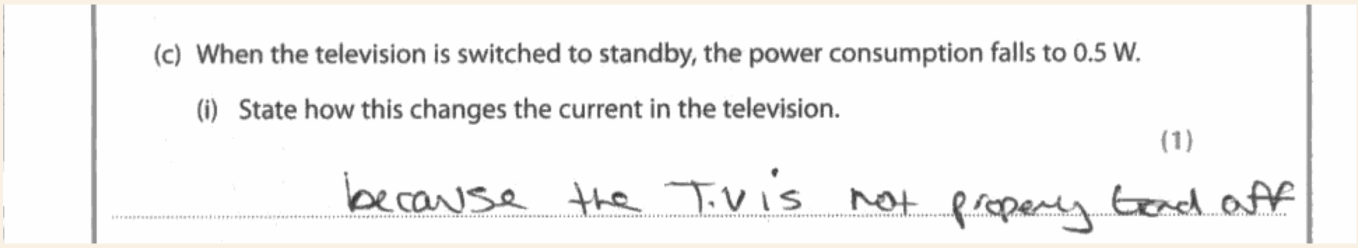
The current is the flow of electricity in a circuit.

ResultsPlus
Examiner Comments

This candidate gained one mark for knowing that current is a flow but not the second mark as electricity was incorrect.

Question 4 (c) (i)

This question required a description of how the current changed, i.e. increased or decreased but many candidates answered it as 'why' not 'how'.



(c) When the television is switched to standby, the power consumption falls to 0.5 W.

(i) State how this changes the current in the television.

(1)

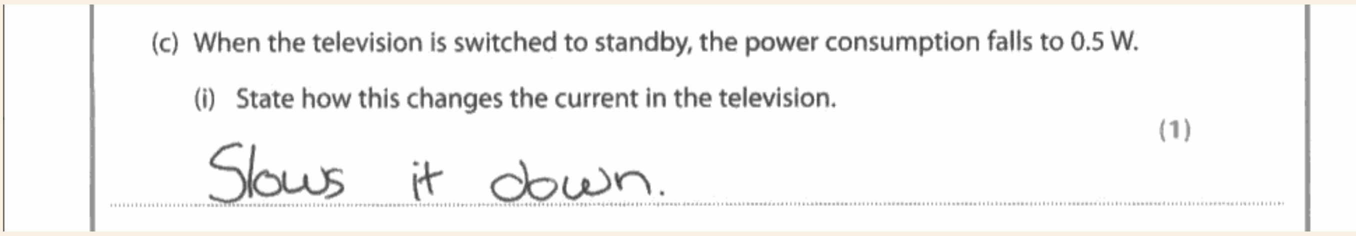
because the T.v is not propery tend off

ResultsPlus
Examiner Comments

This example answered the question 'why' and was not awarded any marks.

ResultsPlus
Examiner Tip

Read the question carefully and answer what is asked.



(c) When the television is switched to standby, the power consumption falls to 0.5 W.

(i) State how this changes the current in the television.

(1)

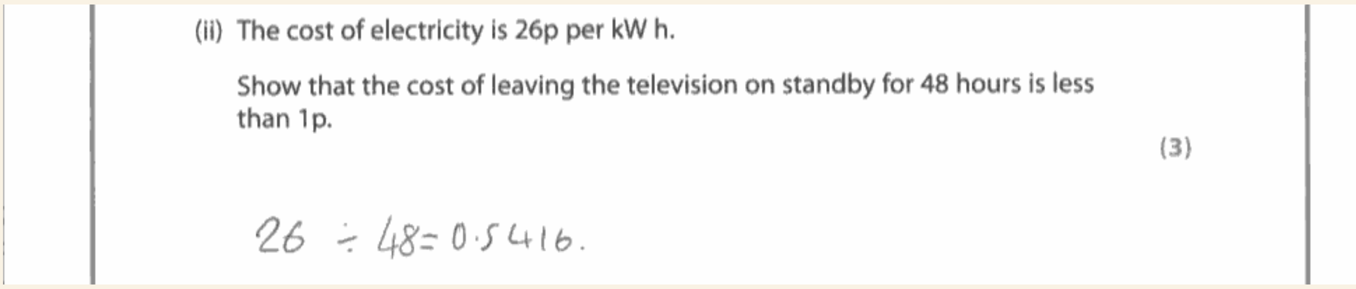
Slows it down.

ResultsPlus
Examiner Comments

The current slows down was also an acceptable answer as current is the rate of flow of charge.

Question 4 (c) (ii)

The required equation was given in the formulae section at the front of the paper and candidates should have been encouraged to use this throughout the course. The need to change watts to kilowatts should also be apparent from the equation as the cost is given per kilowatt-hour. This question was either answered poorly or not attempted.



(ii) The cost of electricity is 26p per kW h.

Show that the cost of leaving the television on standby for 48 hours is less than 1p.

(3)

26 ÷ 48= 0.5416.

ResultsPlus

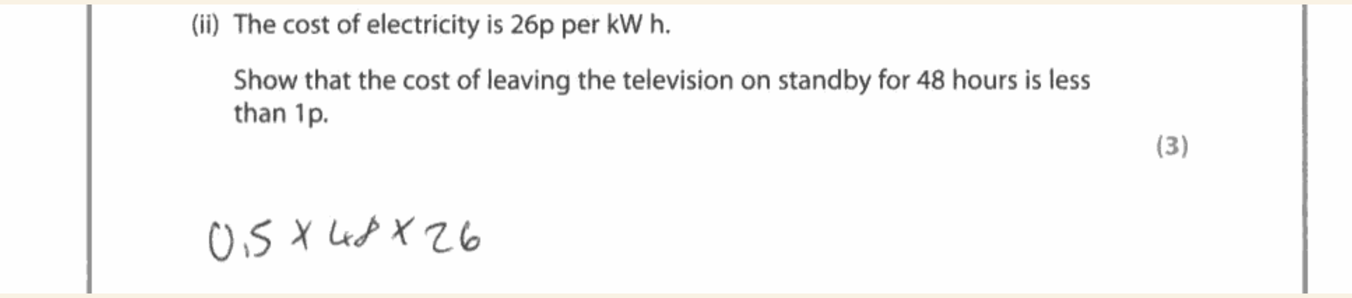
Examiner Comments

This was a common type of answer showing that the candidate was unsure of what to do with the values given. The use of the equation would have shown that multiplication was required and not division.

ResultsPlus

Examiner Tip

Make use of the formulae provided.



(ii) The cost of electricity is 26p per kW h.

Show that the cost of leaving the television on standby for 48 hours is less than 1p.

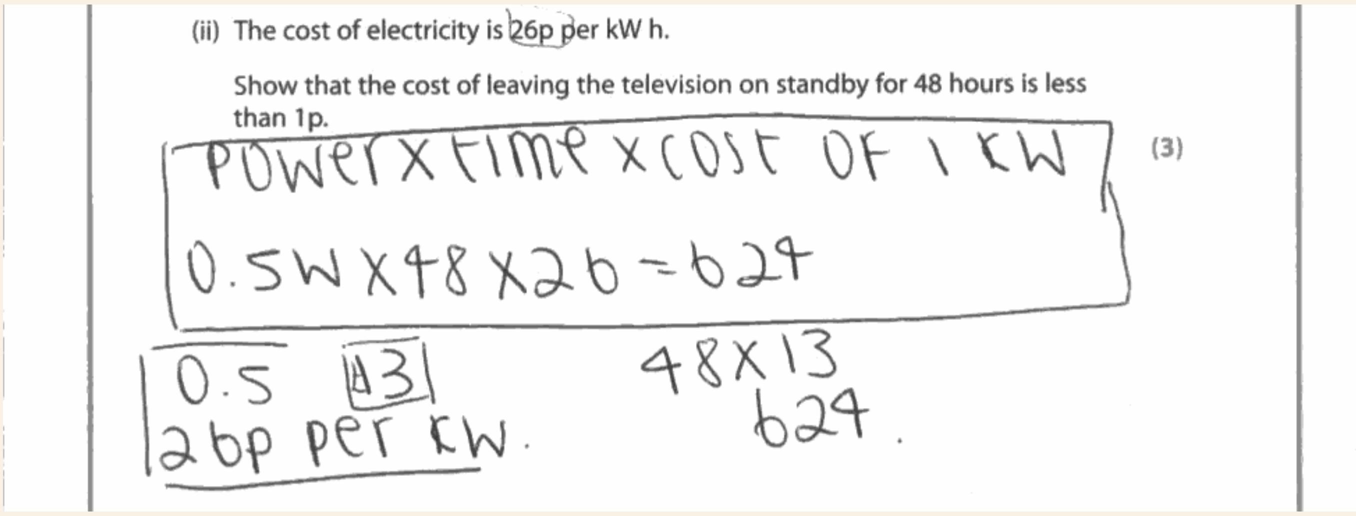
(3)

0,5 × 48 × 26

ResultsPlus

Examiner Comments

Correct substitution without the equation being included, but no change of watts to kilowatts; gained one mark.



(ii) The cost of electricity is 26p per kW h.

Show that the cost of leaving the television on standby for 48 hours is less than 1p.

(3)

Power x time x cost of 1 kW

0.5W x 48 x 26 = 624

0.5 $\boxed{13}$

26p per kW.

48x13

624.

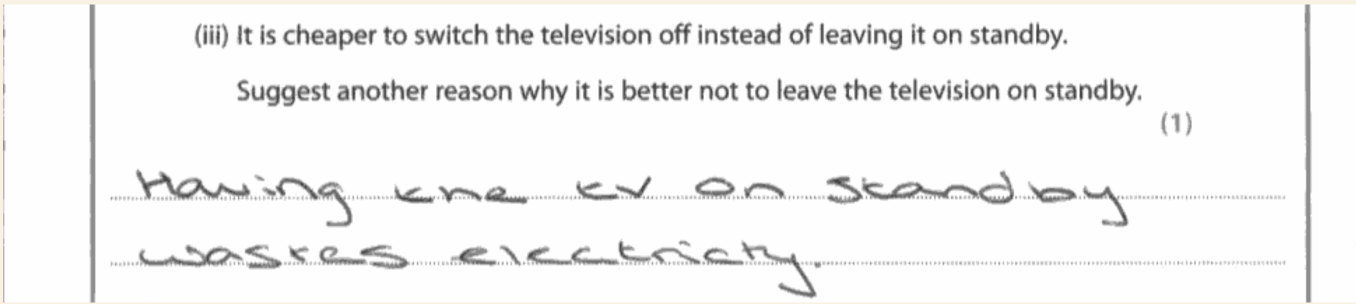
ResultsPlus

Examiner Comments

This work was worthy of two marks as the values were substituted into the equation which had been written and from the values used the correct answer had been obtained. There was one error, the value of the power had not been converted to watts and so the final mark could not be awarded.

Question 4 (c) (iii)

The introduction to this question included the fact that switching the television off is cheaper than leaving it on standby and then asks for another reason why it is better not to leave the television on standby. Many candidates did not read the whole question and still said it would be cheaper. The other common misconception was that electricity would be wasted. Electricity is not wasted, it is the energy produced by the electricity that is wasted.



(iii) It is cheaper to switch the television off instead of leaving it on standby.

Suggest another reason why it is better not to leave the television on standby.

(1)

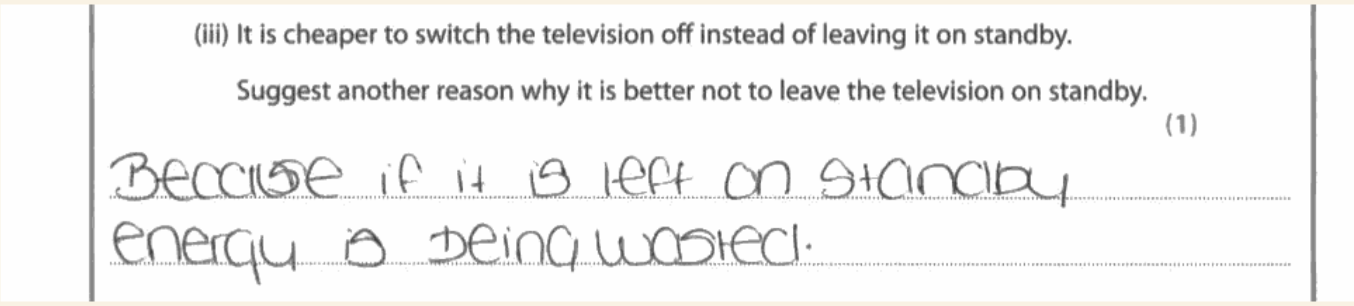
Having the tv on standby wastes electricity.

ResultsPlus
Examiner Comments

This was an incorrect answer, so no mark was awarded.

ResultsPlus
Examiner Tip

Remember it is energy lost not electricity.



(iii) It is cheaper to switch the television off instead of leaving it on standby.

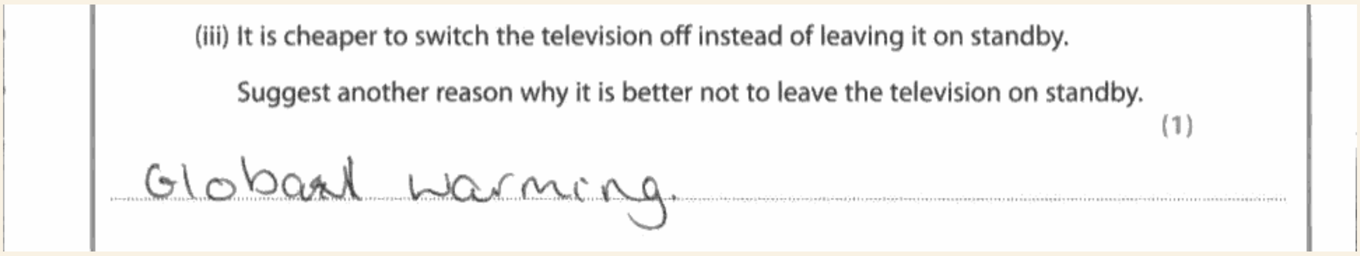
Suggest another reason why it is better not to leave the television on standby.

(1)

Because if it is left on standby energy is being wasted.

ResultsPlus
Examiner Comments

This was correct answer gained one mark.



(iii) It is cheaper to switch the television off instead of leaving it on standby.

Suggest another reason why it is better not to leave the television on standby.

(1)

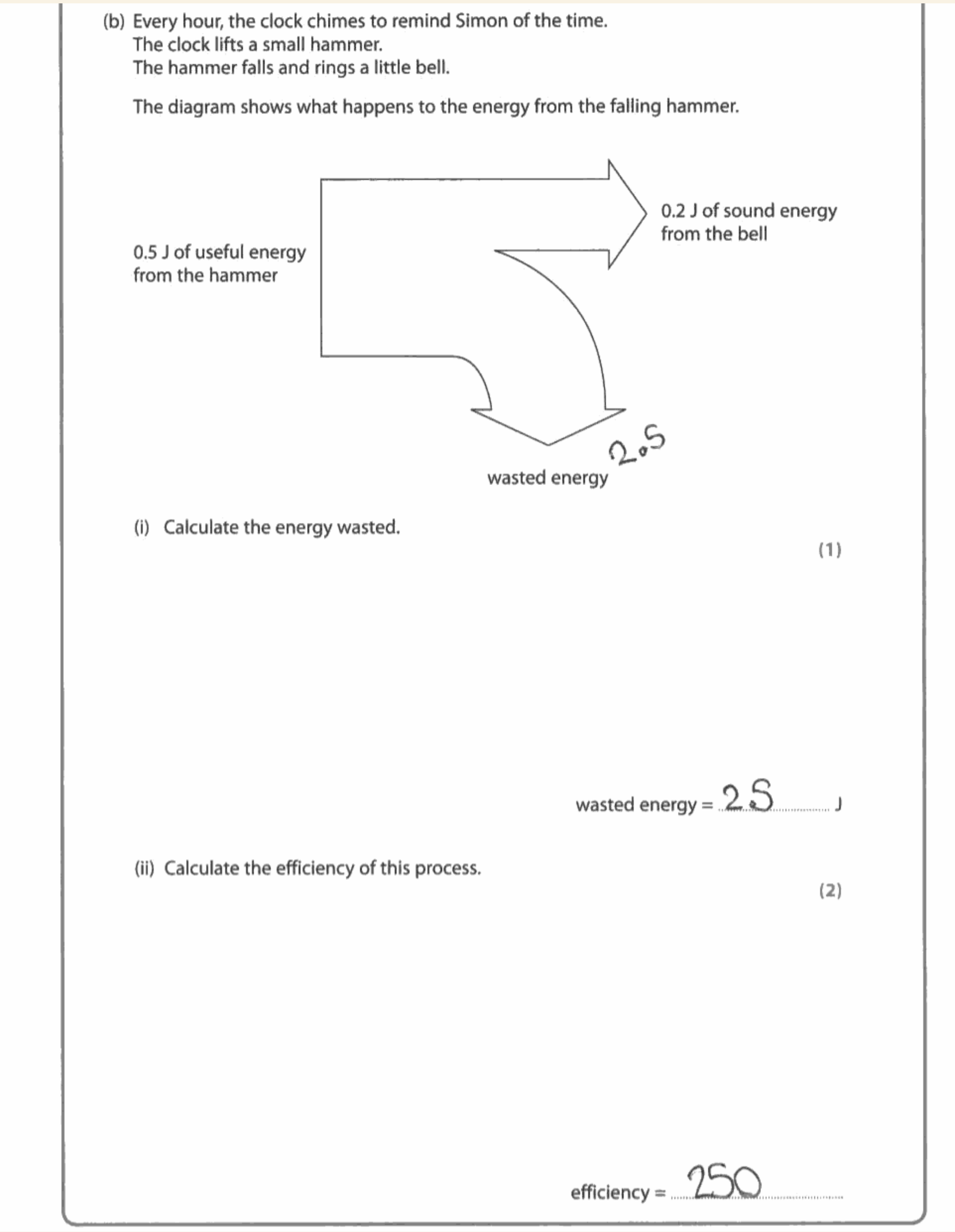
Global warming.

ResultsPlus
Examiner Comments

A very short answer but gave one specifically named atmospheric pollution and gained one mark.

Question 5 (b)

This question was in three parts; 5bi was generally answered well, most candidates could calculate the energy wasted. 5bii was found challenging by many, as most did not know how to use the value that they had obtained even though the equation was given on page 2 of the examination paper. 5bii required candidates to provide the specific information that the wasted energy was heat and this was dissipated into the atmosphere.



(b) Every hour, the clock chimes to remind Simon of the time.
The clock lifts a small hammer.
The hammer falls and rings a little bell.

The diagram shows what happens to the energy from the falling hammer.

0.5 J of useful energy from the hammer

0.2 J of sound energy from the bell

wasted energy

2.5

(i) Calculate the energy wasted.

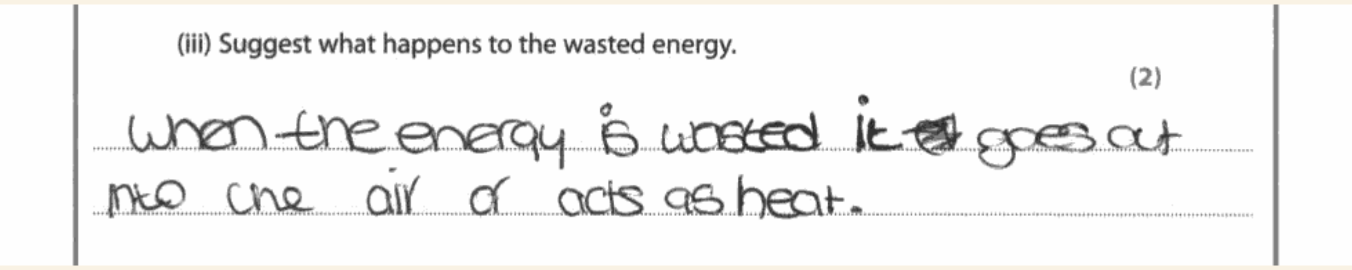
(1)

wasted energy = 2.5 J

(ii) Calculate the efficiency of this process.

(2)

efficiency = 250



(iii) Suggest what happens to the wasted energy.

(2)

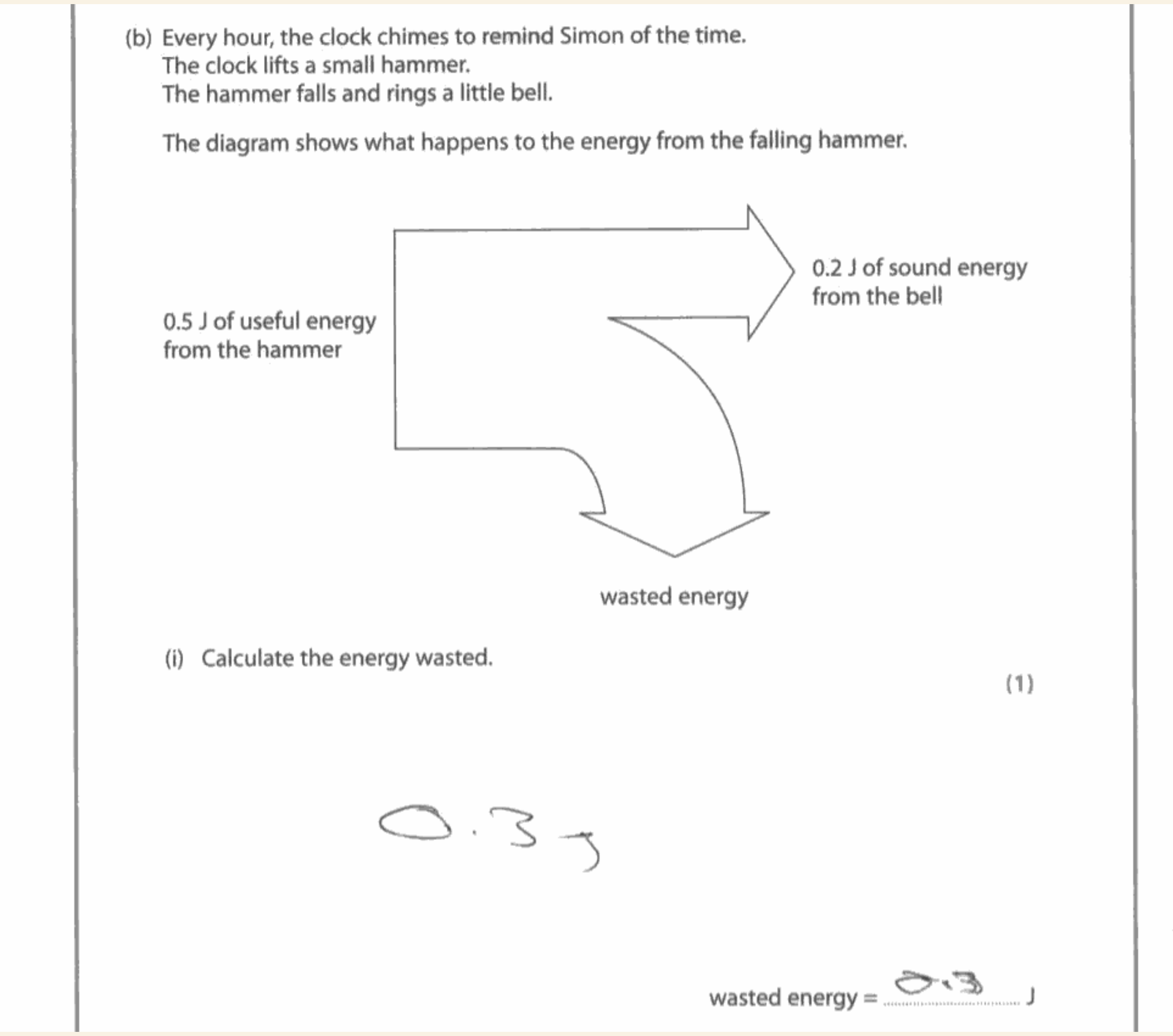
When the energy is wasted it ~~[illegible]~~ goes out into the air or acts as heat.

ResultsPlus
Examiner Comments

Although no marks have been obtained for the calculations the last part is precise enough to gain two marks.

ResultsPlus
Examiner Tip

Remember when machines move they produce heat and that this goes into the atmosphere.



(b) Every hour, the clock chimes to remind Simon of the time.
The clock lifts a small hammer.
The hammer falls and rings a little bell.

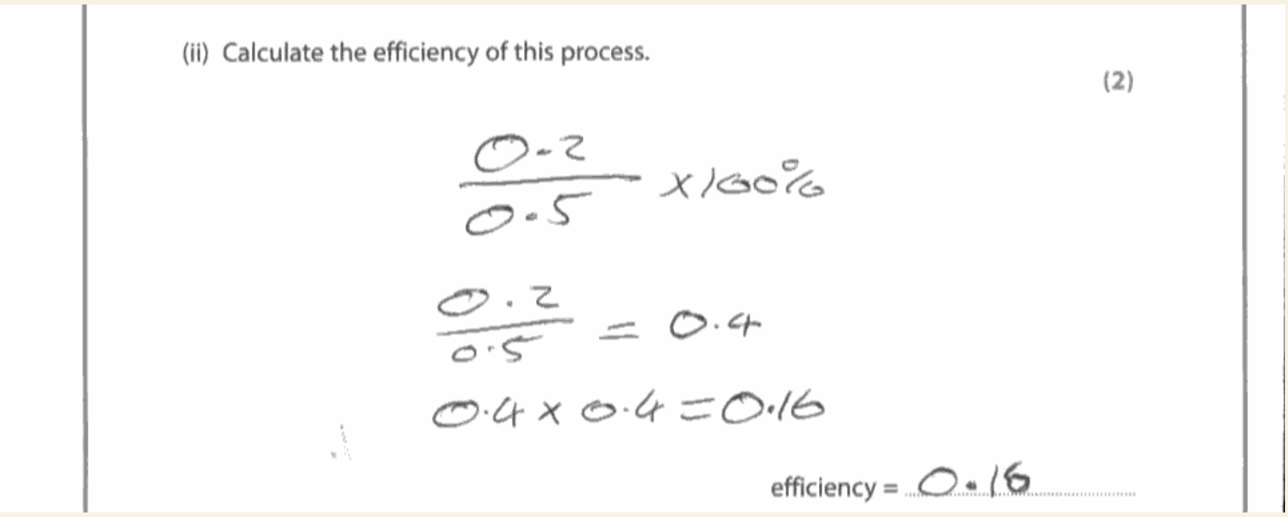
The diagram shows what happens to the energy from the falling hammer.

(i) Calculate the energy wasted.

(1)

0.3 J

wasted energy = 0.3 J



(ii) Calculate the efficiency of this process.

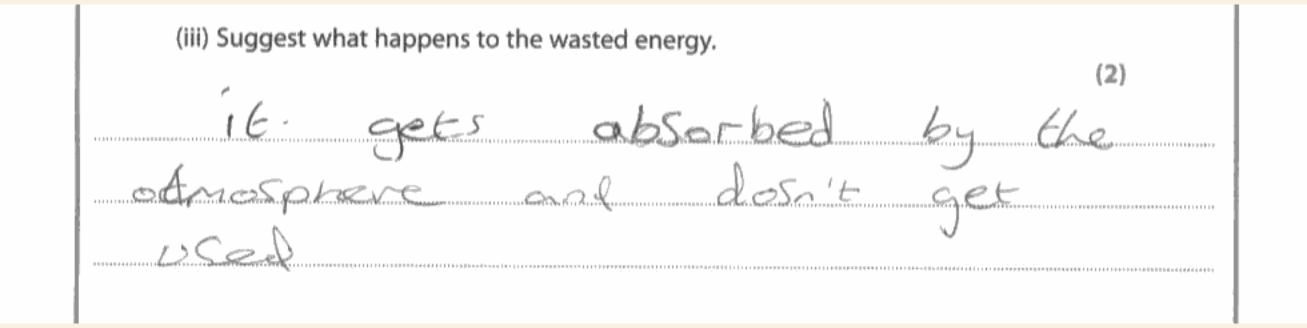
(2)

$$\frac{0.2}{0.5} \times 100\%$$

$$\frac{0.2}{0.5} = 0.4$$

$$0.4 \times 0.4 = 0.16$$

efficiency = 0.16



(iii) Suggest what happens to the wasted energy.

(2)

it gets absorbed by the atmosphere and dosn't get used

ResultsPlus

Examiner Comments

Candidates needed to realise that the useful energy transferred by the device was the sound energy in order to successfully use the equation.

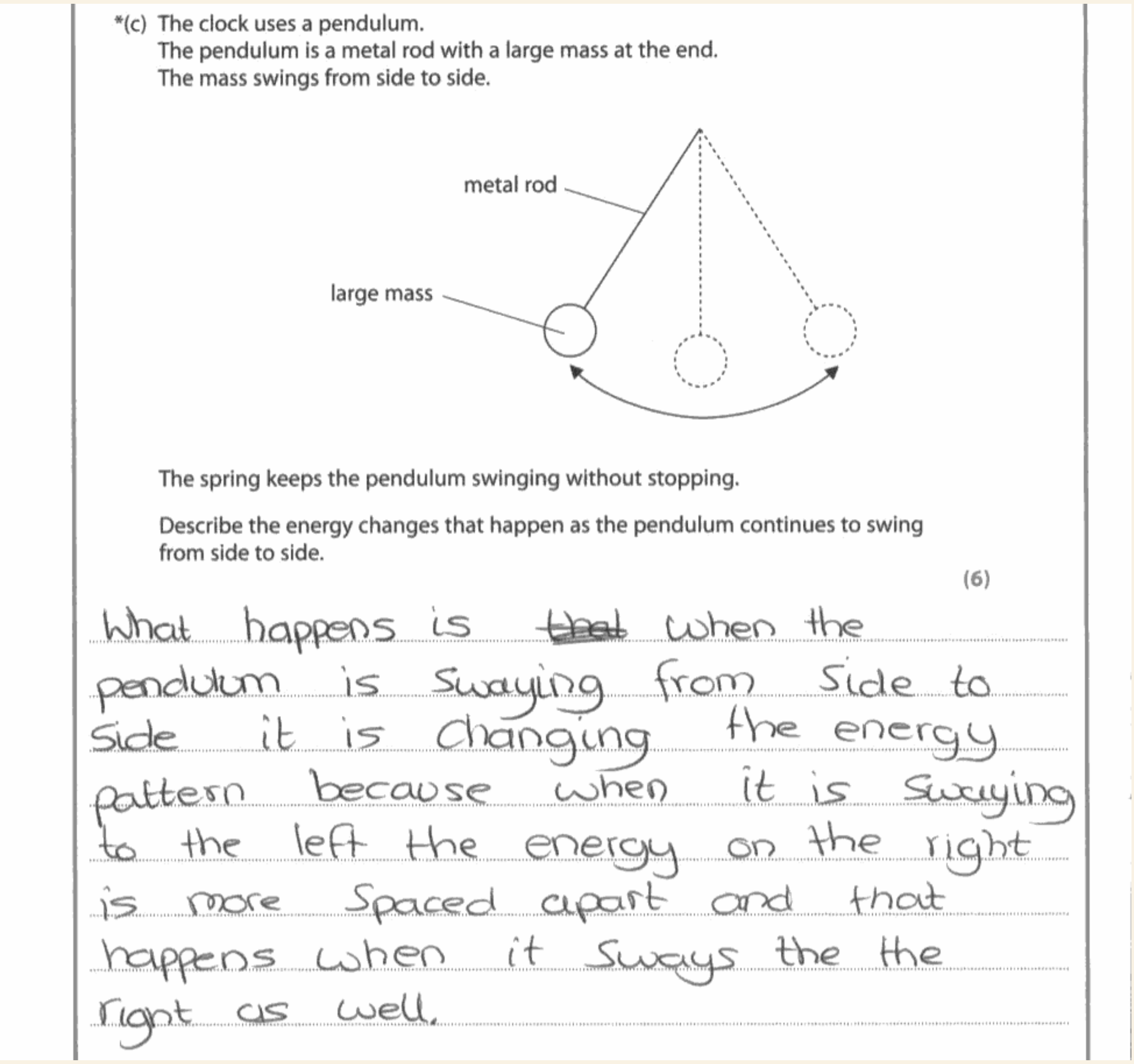
ResultsPlus

Examiner Tip

The energy that is turned into the useful purpose of the device is the energy which is compared to the total input energy to work out efficiency.

Question 5 (c)

Candidates must appreciate that when energy changes are required then specific forms of energy must be given in the answer. A general description of a swinging pendulum without the mention of forms of energy that are included will not gain any marks. Where answers did include a relevant form of energy Level 1 was achieved. If the location of this energy was given, such as the moving pendulum has kinetic energy then this was sufficient to achieve Level 2. When a correct energy transfer was also included then Level 3 could be achieved.



*(c) The clock uses a pendulum.
The pendulum is a metal rod with a large mass at the end.
The mass swings from side to side.

The spring keeps the pendulum swinging without stopping.

Describe the energy changes that happen as the pendulum continues to swing from side to side.

(6)

What happens is ~~that~~ when the pendulum is Swaying from Side to Side it is Changing the energy pattern because when it is Swaying to the left the energy on the right is more Spaced apart and that happens when it Sways the the right as well.

ResultsPlus

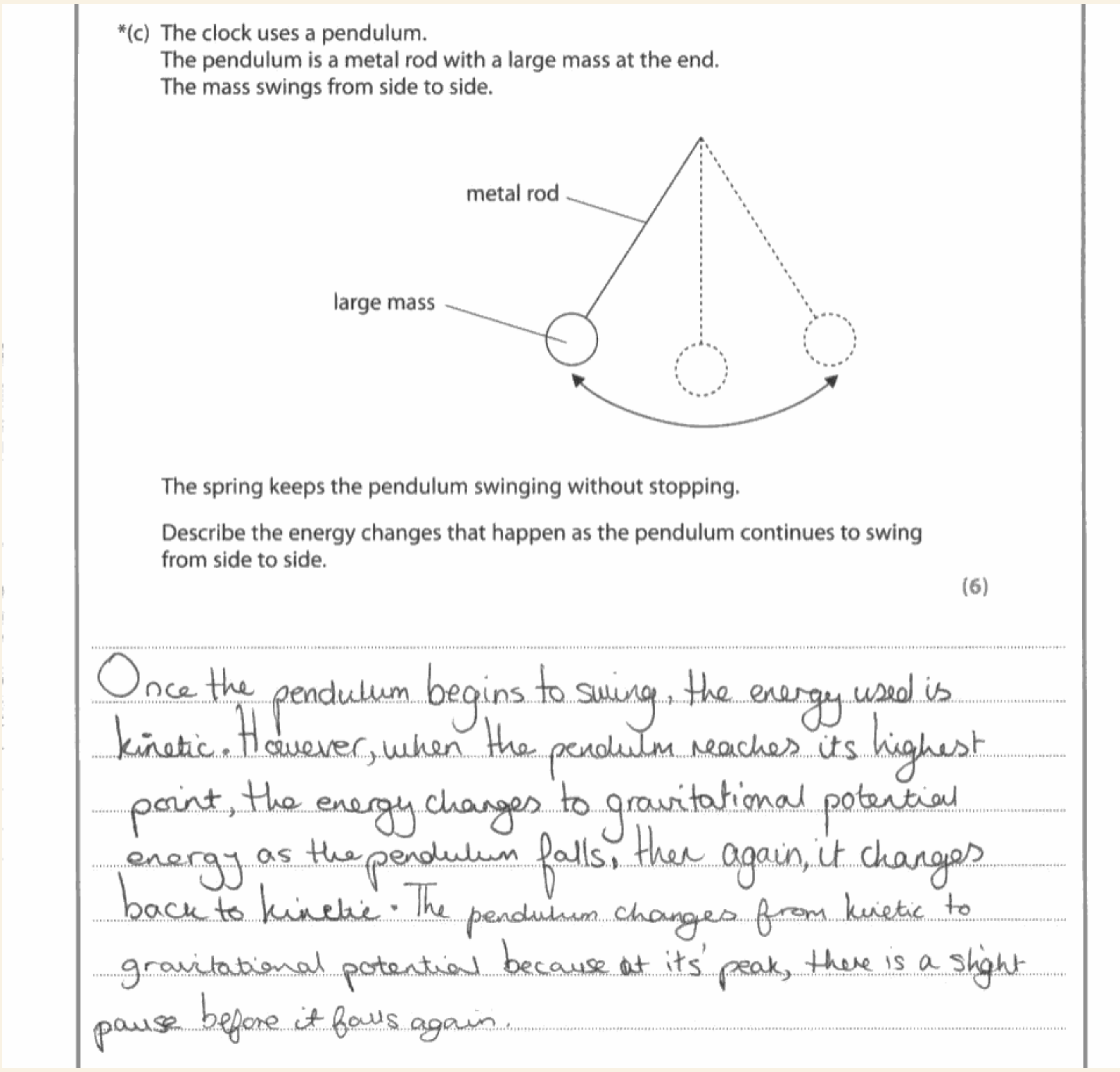
Examiner Comments

This answer scored no marks because it did not use specific forms of energy to describe what was happening.

ResultsPlus

Examiner Tip

Remember to use your science knowledge to answer the questions.



*(c) The clock uses a pendulum.
The pendulum is a metal rod with a large mass at the end.
The mass swings from side to side.

The spring keeps the pendulum swinging without stopping.

Describe the energy changes that happen as the pendulum continues to swing from side to side.

(6)

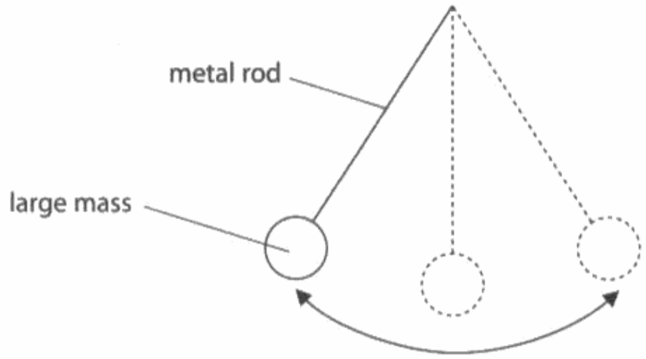
Once the pendulum begins to swing, the energy used is kinetic. However, when the pendulum reaches its highest point, the energy changes to gravitational potential energy as the pendulum falls. then again, it changes back to kinetic. The pendulum changes from kinetic to gravitational potential because at its' peak, there is a slight pause before it falls again.

ResultsPlus

Examiner Comments

This is an excellent answer which satisfies all the requirements to achieve 6 marks at Level 3.

*(c) The clock uses a pendulum.
The pendulum is a metal rod with a large mass at the end.
The mass swings from side to side.



The spring keeps the pendulum swinging without stopping.

Describe the energy changes that happen as the pendulum continues to swing from side to side.

(6)

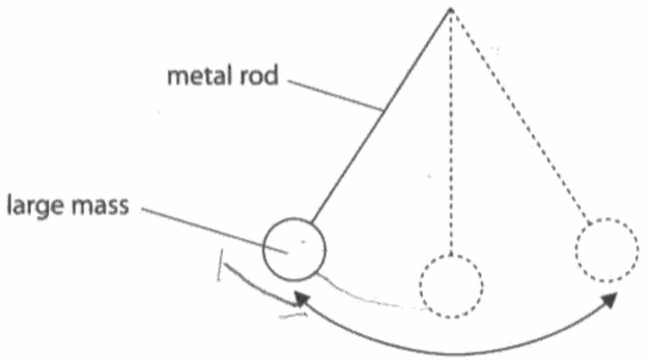
Kenetic ~~eng~~ energy goes into gravit~~g~~ational potential energy which then goes into kenetic energy again.

ResultsPlus

Examiner Comments

This is an example of a correct energy transfer which achieved Level 2 and gained four marks.

*(c) The clock uses a pendulum.
The pendulum is a metal rod with a large mass at the end.
The mass swings from side to side.



The spring keeps the pendulum swinging without stopping.

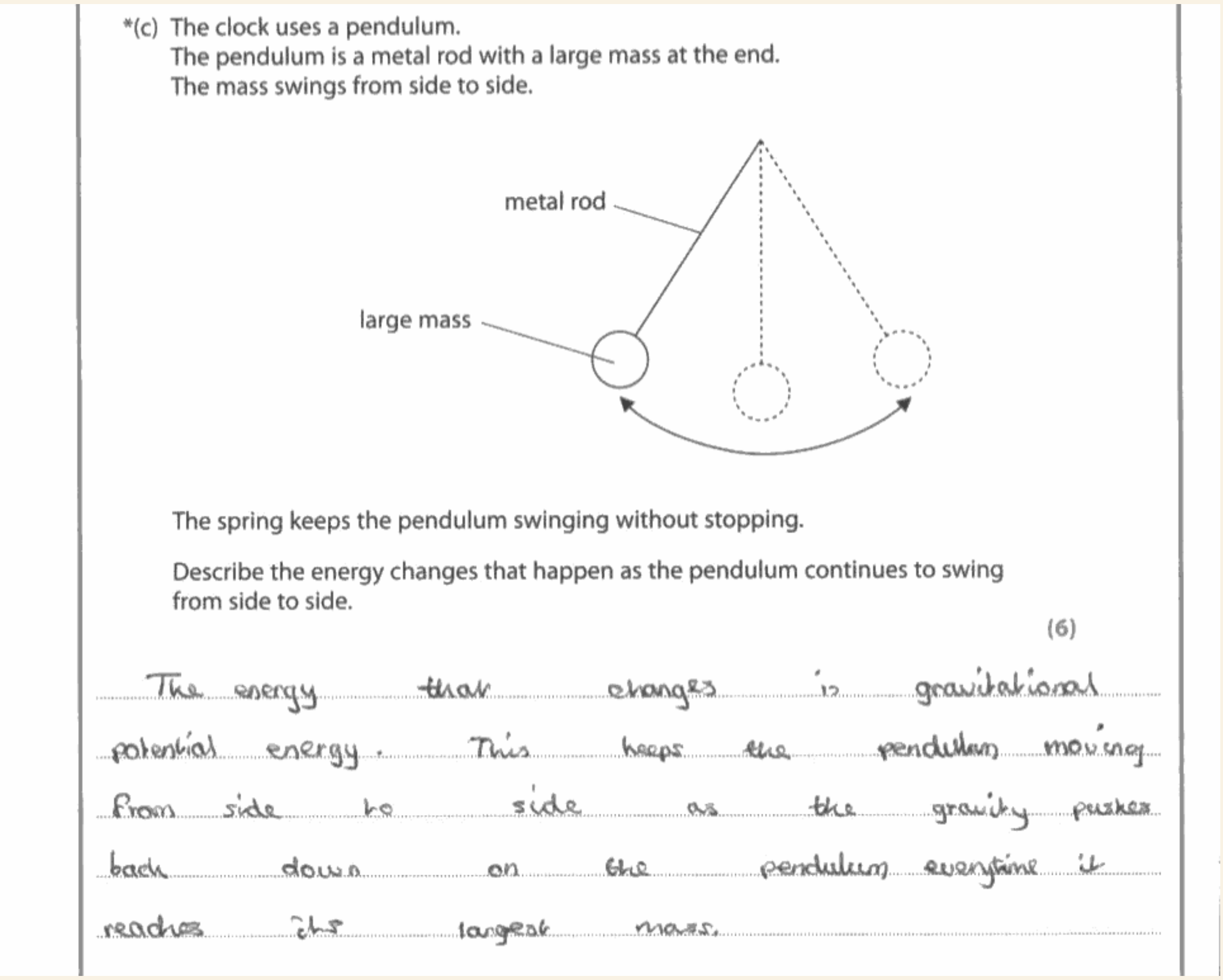
Describe the energy changes that happen as the pendulum continues to swing from side to side.

(6)

The energy changes from slow to fast as more energy is used as the pendulum continues to swing. Kinetic energy is used as the pendulum is always moving. The large mass of the pendulum uses up more energy ~~as the e~~ as it is heavier Slowing the pendulum down.

ResultsPlus
Examiner Comments

This example was awarded a Level 2 as it included kinetic energy and where this energy is to be found.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The pendulum is a metal rod with a large mass at the end.
The mass swings from side to side.

The spring keeps the pendulum swinging without stopping.

Describe the energy changes that happen as the pendulum continues to swing from side to side.

(6)

The energy that changes is gravitational potential energy. This keeps the pendulum moving from side to side as the gravity pushes back down on the pendulum everytime it reaches its largest mass.

ResultsPlus

Examiner Comments

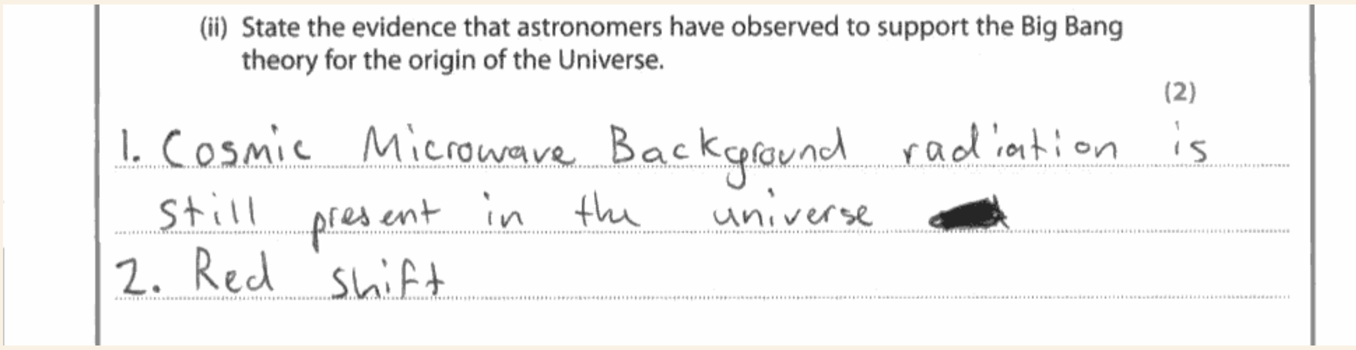
This example correctly gave gravitational potential energy but wrongly located it as keeping the pendulum moving. This was a Level 1 answer.

Question 6 (b) (i)

This answer required the wavelength or frequency of the wave to be mentioned and then for the correct change to be given. The scientific term for the characteristic of the wave that is changing must be included.

Question 6 (b) (ii)

Candidates were generally able to gain one mark for knowing red shift or that the universe is expanding. Fewer realised that cosmic microwave background radiation is the best support for the Big Bang theory.



(ii) State the evidence that astronomers have observed to support the Big Bang theory for the origin of the Universe.

(2)

1. Cosmic Microwave Background radiation is still present in the universe

2. Red shift

ResultsPlus
Examiner Comments

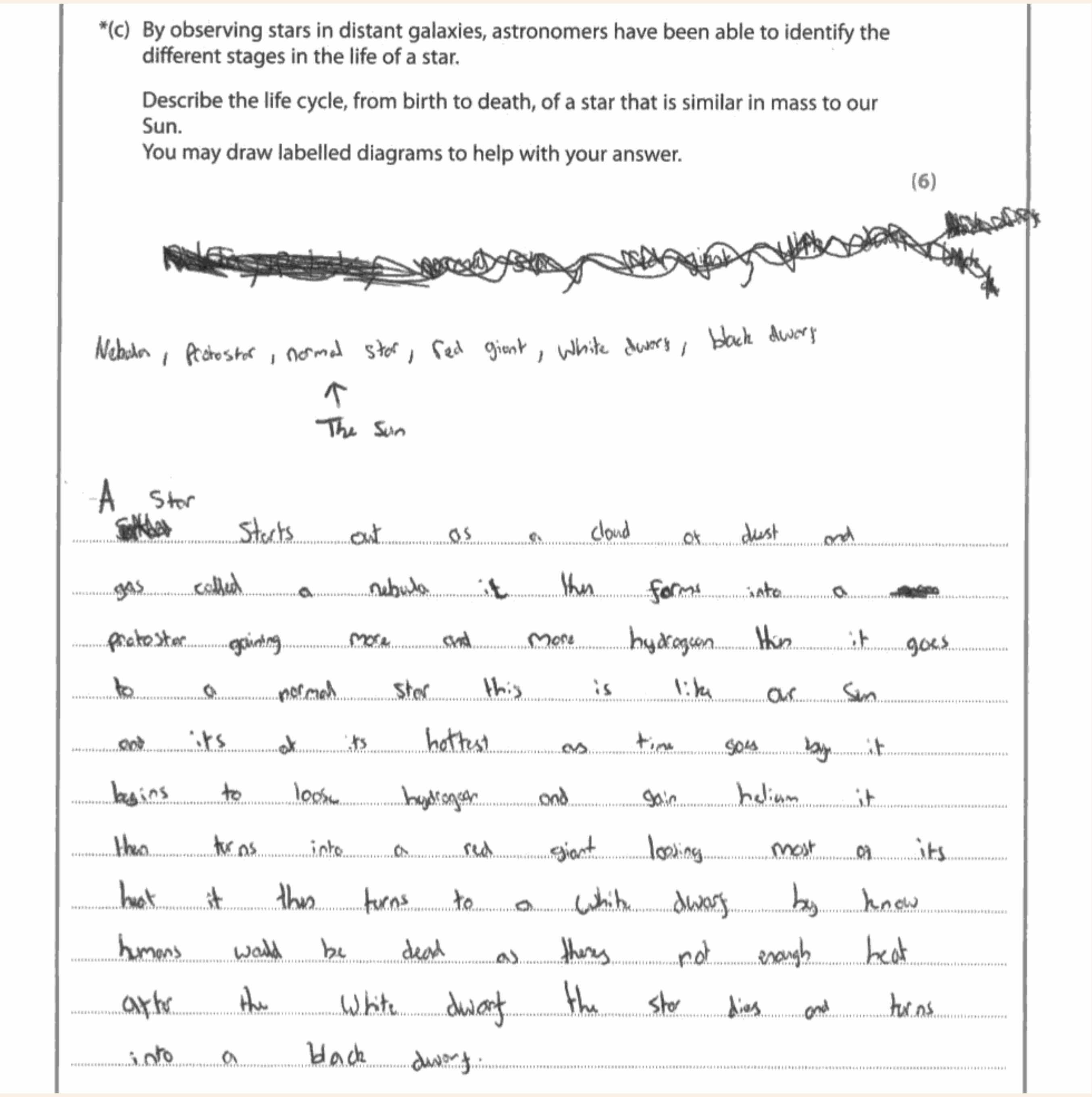
This correct answer gained two marks.

ResultsPlus
Examiner Tip

Some facts need to be learnt.

Question 6 (c)

The majority of candidates were able to name at least one stage in the life cycle of a star, the size of our Sun and therefore achieved level one. Many candidates had an excellent knowledge of this topic and were able to support their description with the use of a diagram and achieve the full six marks at Level 3.



*(c) By observing stars in distant galaxies, astronomers have been able to identify the different stages in the life of a star.

Describe the life cycle, from birth to death, of a star that is similar in mass to our Sun.
You may draw labelled diagrams to help with your answer.

(6)

Nebula , Protostar , normal star , red giant , white dwarf , black dwarf
↑
The Sun

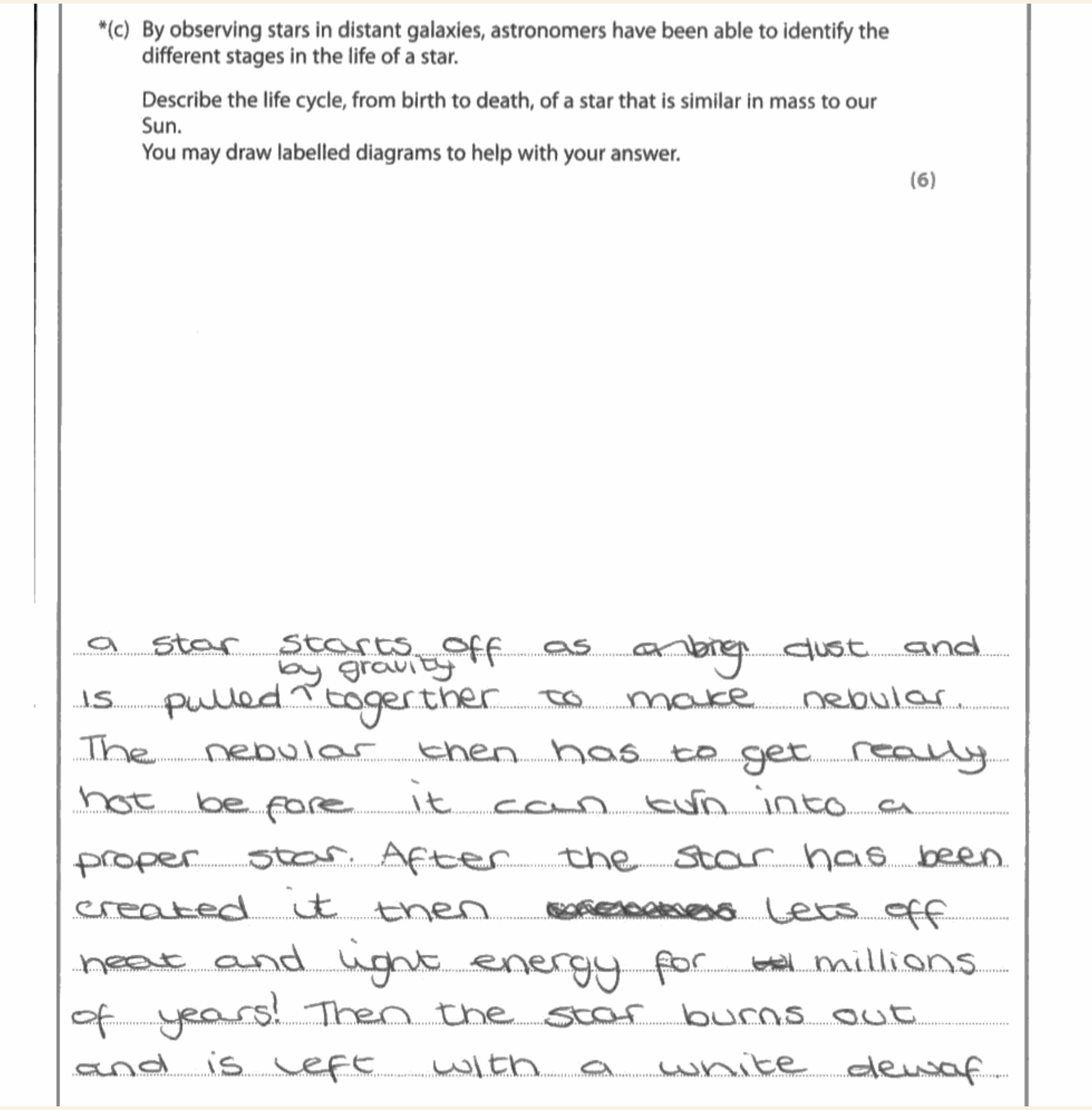
A Star Starts out as a cloud of dust and gas called a nebula it then forms into a protostar gaining more and more hydrogen then it goes to a normal star this is like our Sun and its at its hottest as time goes by it begins to loose hydrogen and gain helium it then turns into a red giant loosing most of its heat it then turns to a white dwarf by know humans would be dead as theres not enough heat after the white dwarf the star dies and turns into a black dwarf.

ResultsPlus
Examiner Comments

An excellent answer that showed the correct order of at least three stages and gave details of at least one stage.

ResultsPlus
Examiner Tip

Learn work accurately and practice describing processes and explaining phenomena prior to sitting the examination.



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Describe the life cycle, from birth to death, of a star that is similar in mass to our Sun.
You may draw labelled diagrams to help with your answer.

(6)

a star starts off as an big dust and is pulled by gravity togerther to make nebular. The nebular then has to get really hot be fore it can turn into a proper star. After the star has been created it then lets off heat and light energy for millions of years! Then the star burns out and is left with a white dewaf.

ResultsPlus

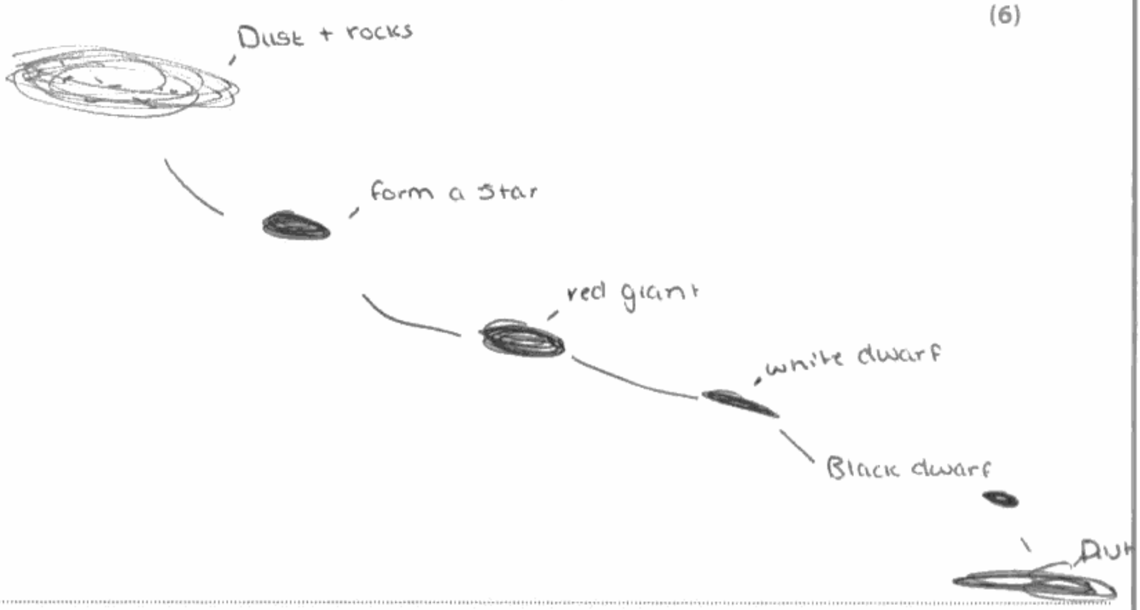
Examiner Comments

This example had two stages correct and explains how gravity pulls the dust together to form a nebula. However the red giant stage was missing and a Level 2 was awarded.

*(c) By observing stars in distant galaxies, astronomers have been able to identify the different stages in the life of a star.

Describe the life cycle, from birth to death, of a star that is similar in mass to our Sun.
You may draw labelled diagrams to help with your answer.

(6)



the star starts of as dust and rocks, they all start smashing together, making energy and heat, they form a ball of gas / star. the star then turns into a red giant, then gets smaller and then turns into a white dwarf from then it turns into a black dwarf because all the heat and energy is gone. It then finally goes Back into dust and Rocks.

ResultsPlus

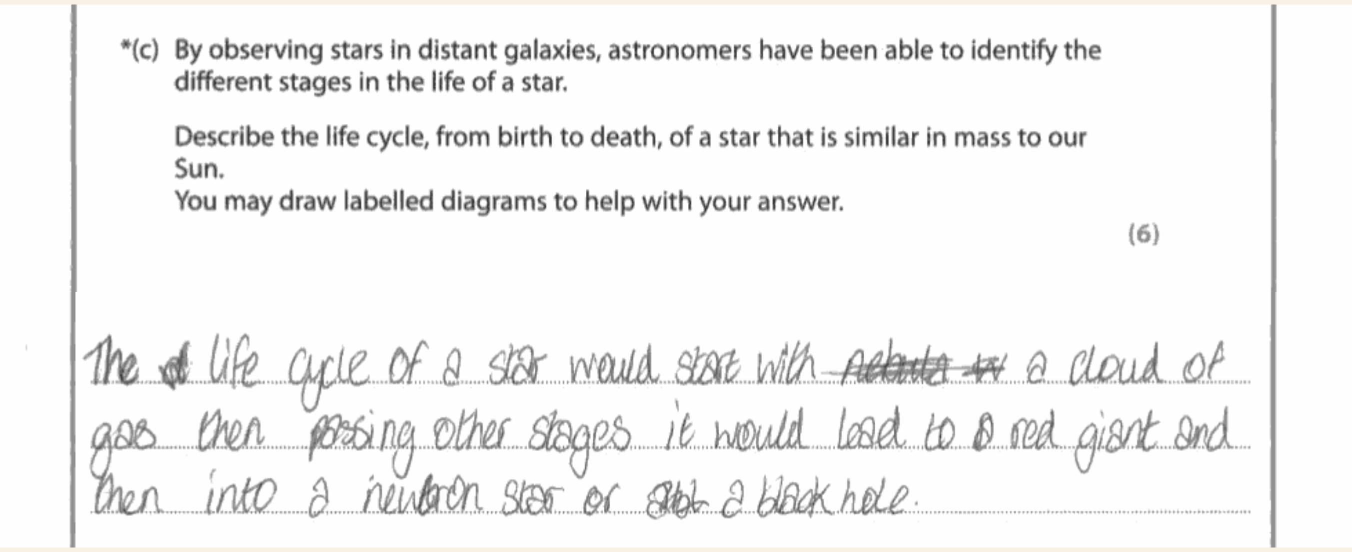
Examiner Comments

This explanation also had the benefit of a diagram which gave the order of the stages correctly. The only detail was about the first stage and this was not named so only a Level 2 could be achieved.
Score: four marks.

ResultsPlus

Examiner Tip

Diagrams can help with your answers.



*(c) By observing stars in distant galaxies, astronomers have been able to identify the different stages in the life of a star.

Describe the life cycle, from birth to death, of a star that is similar in mass to our Sun.
You may draw labelled diagrams to help with your answer.

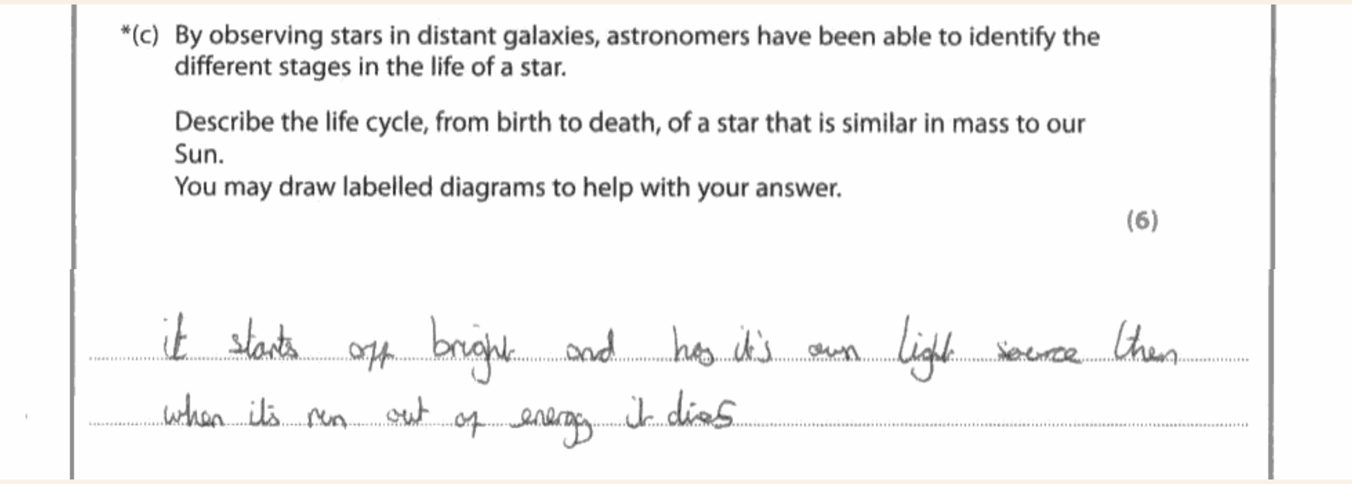
(6)

The ~~a~~ life cycle of a star would start with ~~nebula~~ a cloud of gas then passing other stages it would lead to ~~a~~ a red giant and then into a neutron star or ~~abl~~ a black hole.

ResultsPlus

Examiner Comments

The candidate knew that the star starts off as a cloud of dust and gas but this was not named. The red giant, however, was named and a Level 1 was achieved.



*(c) By observing stars in distant galaxies, astronomers have been able to identify the different stages in the life of a star.

Describe the life cycle, from birth to death, of a star that is similar in mass to our Sun.
You may draw labelled diagrams to help with your answer.

(6)

it starts off bright and has it's own light source then when its run out of energy it dies

ResultsPlus

Examiner Comments

No stage in the life cycle was given and no marks were awarded.

Paper Summary

In order to improve their performance, candidates should:

· use scientific terms in explanations

· use the formulae section at the front of the examination paper throughout the course so that they become familiar with finding the correct equation to use

· learn to read diagrams correctly; this is particularly important when light rays are being used

· draw labelled diagrams to add value and enhance a written explanation

· have a calculator to use as this is an essential requirement for this examination

· use scientific terms with precision in order to gain maximum marks

· learn processes and practice explaining phenomena prior to sitting the examination.

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