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Examiners' Report
June 2024

Int GCSE Single Science 4SS0 1P

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June 2024

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Introduction

This was the fifth Summer series Physics examination for the International GCSE Single Award Science qualification. Questions were set to assess candidates' knowledge, understanding and application of Physics from all eight topics in the specification. This year, candidates were once again provided with a full formulae sheet for the examination, which removed the requirement to recall any of the formulae.

The examination was written to assess across the full range of grades from 1 to 9. Consequently, some questions were written to be challenging whilst others were designed to be more straightforward and accessible. A range of different question types were included in the examination such as objective and multiple choice, calculations and both short and long written responses. Approximately 20% of the marks available in the examination were for candidates' demonstration of experimental skills and understanding.

Successful candidates were well-acquainted with the content of the specification and could recall facts whilst applying their understanding to new and complex situations. They were competent in performing quantitative work and could rearrange formulae to obtain the correct answer. Successful candidates also showed evidence of undertaking all the required practicals themselves and could produce detailed, coherent methods whilst recalling the relevant results of these experiments.

Less successful candidates showed gaps in their knowledge of topics and either had limited experience or could not recall information from the required practical tasks. These candidates often did not address the demands of the question and overlooked the importance of the command words being used.

Question 1 (a)(i)

Many candidates limited themselves in this question by only mentioning one point. Therefore they were unable to gain full marks. Many would say no current can flow around the circuit, but did not go on to say why the current cannot flow. Some attempted to justify their statement by simply saying as one switch is still open, rather than say the circuit was still broken. Some candidates commented that the circuit is broken, but did not go on to mention about the effect on the current flow. Some candidates used a bad choice of wording, e.g. no flow of electrons/energy/electricity/power/particles.

(a) The lawnmower has two switches in its circuit.

(i) Explain why the motor will not turn when only one switch is closed.

(2)

Because if only one swith is closed there would be a gap in the circuit making it incomplete. Electrons won't pass through the gap.

ResultsPlus
Examiner Comments

This response scored 1 mark. The candidate has identified that the circuit is incomplete, but has not linked this sufficiently to the lack of current – their response indicates that electrons can still flow part way round the circuit and stop at the gap.

(a) The lawnmower has two switches in its circuit.

(i) Explain why the motor will not turn when only one switch is closed.

(2)

Because the cicuit will not be complete as there will be a hole and current will not be able to circulate and the motor will not ~~recive~~ receive power.

ResultsPlus
Examiner Comments

This response scored 2 marks. Both ideas are suficiently communicated.

Question 1 (a)(ii)

It was encouraging to see nearly half of all candidates recognise that the inclusion of two switches in the circuit was linked to safety. Incorrect responses included:

- Backup switch if the other switch breaks.
- Each switch is used to control a different part of the lawnmower, e.g. switch 1 turns the motor on, switch 2 controls the blade.
- A kill switch to cut off the power supply abruptly.
- The motor is too powerful for one switch.
- Improved control of the current.

Question 1 (b)

Candidates performed well in this question and it was very encouraging to see over two thirds of all candidates achieve at least 4 marks. Unsurprisingly, (due to the inclusion of a full formulae sheet), almost all candidates wrote the formula correctly in Q01(b)(i). Most mistakes in Q01(b)(ii) were due to incorrectly rearranging the formula or not knowing the appropriate unit for resistance.

(b) The lawnmower's motor has a voltage of 18 V across it.

When the motor is turning, there is a current of 8.6 A in the motor.

(i) State the formula linking voltage, current and resistance. (1)

Voltage = Current x resistance

(ii) Calculate the resistance of the motor.

Give the unit. (4)

8.6x18

ohm

resistance = 154.8 unit Ω

ResultsPlus
Examiner Comments

This response scored 1 mark in Q01(b)(i) and 1 mark in Q01(b)(ii). The candidate has only presented incorrect working due to immediately rearranging the formula incorrectly. The single mark was given for writing the correct unit for resistance.

(b) The lawnmower's motor has a voltage of 18 V across it.

When the motor is turning, there is a current of 8.6 A in the motor.

(i) State the formula linking voltage, current and resistance. **(1)**

V = I × R

(ii) Calculate the resistance of the motor.

Give the unit. **(4)**

V = I × R

18 = 8.6 × R

resistance = 154.8 unit Ω

ResultsPlus
Examiner Comments

This response scored 1 mark in Q01(b)(i) and 2 marks in Q01(b)(ii). The candidate has substituted data correctly into the formula and selected the correct unit for resistance. An error in rearranging the equation (not shown) has led to an error in the final evaluation.

ResultsPlus
Examiner Tip

Candidates should be advised to substitute data into formulae before attempting to rearrange them, especially if the candidate experiences difficulty when doing this. Once a formula has been incorrectly rearranged no further marks will be awarded in the calculation.

(b) The lawnmower's motor has a voltage of 18 V across it.

When the motor is turning, there is a current of 8.6 A in the motor.

(i) State the formula linking voltage, current and resistance.

(1)

$V = I \times R$

(ii) Calculate the resistance of the motor.

Give the unit.

(4)

$18 = 8.6 \times R$

$\div 8.6$

$\frac{18}{8.6} = R$

$R = 2.09$

resistance = 2.1 unit Ohms

ResultsPlus
Examiner Comments

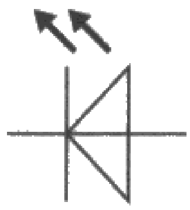
This response scored full marks. The candidate's working is detailed and easy to follow.

Question 1 (c)

Most candidates scored at least 1 mark in this question for placing the LED in an appropriate place in the circuit. However, only around 20% of all candidates scored a further mark for drawing the LED in the correct orientation. Some candidates drew the LED in an unusual orientation on the wires on either side of the circuit, but this was condoned.

(c) The manufacturer of the lawnmower wants to include a light emitting diode (LED) in the circuit that will emit light when the motor is turning.

The circuit symbol for an LED is



Draw the LED on diagram 2 so that it will emit light when the motor is turning.

(2)

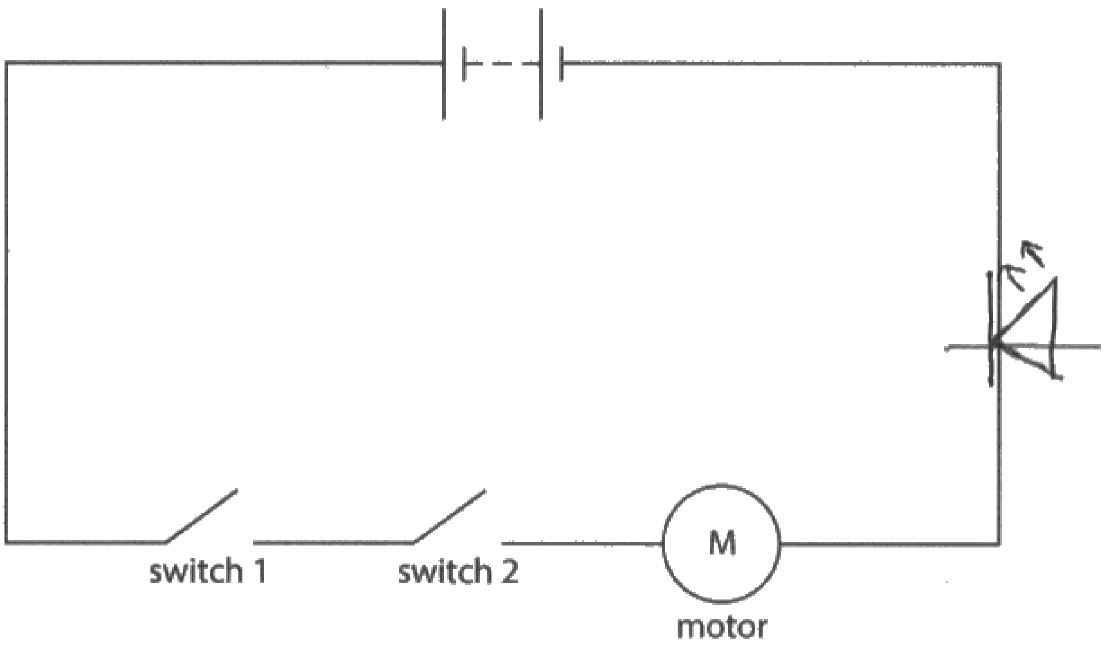


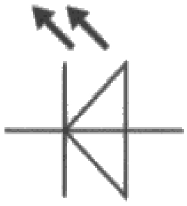
Diagram 2

ResultsPlus Examiner Comments

This candidate has drawn the LED in an unusual orientation in the circuit. However, examiners condoned this for 1 mark due to the intention being to draw it in series with the motor.

(c) The manufacturer of the lawnmower wants to include a light emitting diode (LED) in the circuit that will emit light when the motor is turning.

The circuit symbol for an LED is



Draw the LED on diagram 2 so that it will emit light when the motor is turning.

(2)

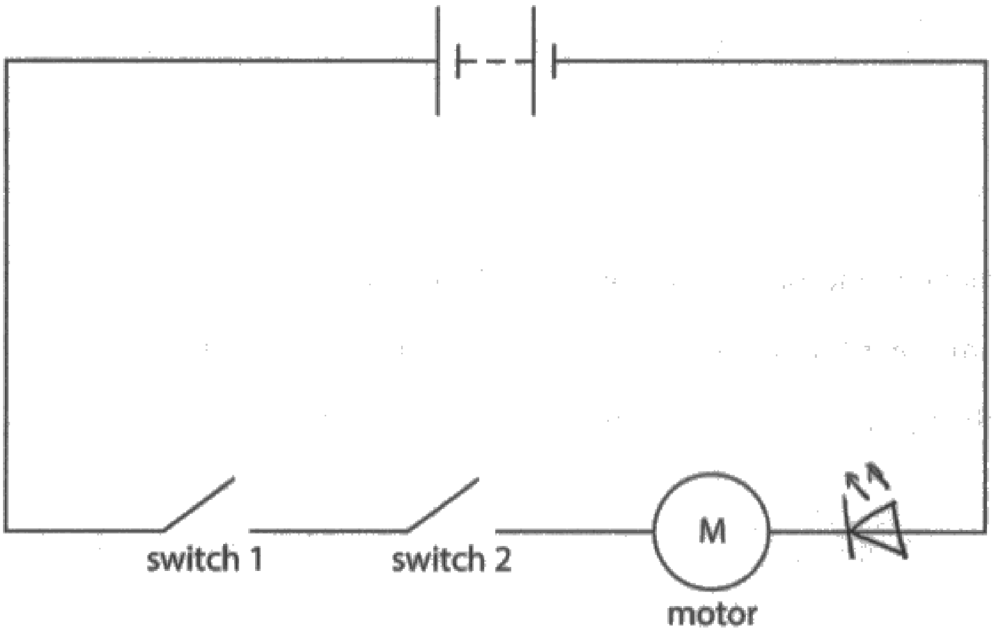
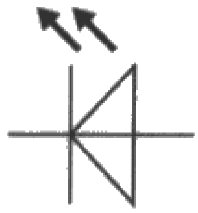


Diagram 2

This response scored 1 mark. The LED is in series with the motor but is in the incorrect orientation.

(c) The manufacturer of the lawnmower wants to include a light emitting diode (LED) in the circuit that will emit light when the motor is turning.

The circuit symbol for an LED is



Draw the LED on diagram 2 so that it will emit light when the motor is turning.

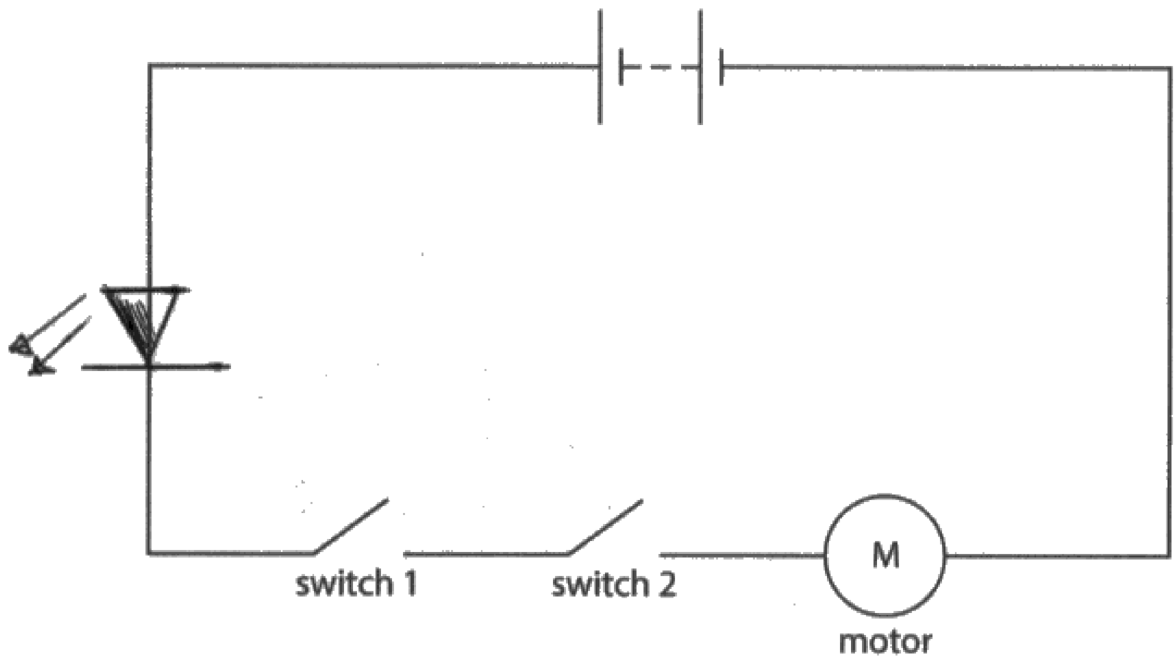


Diagram 2

ResultsPlus
Examiner Comments

This response scored 2 marks. The LED is in the correct orientation and is drawn in series with the motor.

Question 2 (a)

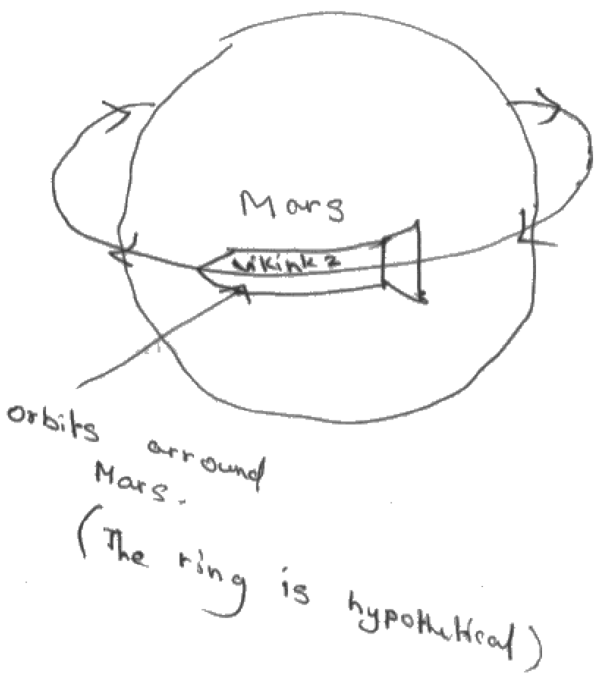
It was surprising to see many candidates struggle with this question. Nearly half of all candidates scored no marks at all. In general, the lack of accuracy and care when drawing the orbital diagrams was poor and many candidates included unnecessary details such as drawing Viking 2 as a picture, rather than a simple labelled shape or point. Other candidates drew a very large circle for Mars, which led to it being not in the centre of the orbit (examiners judged this by comparing the centre of Mars to the central position of the orbit). Some candidates tried to draw the orbit in 3D, which led to them losing the mark for the shape of the orbit.

2 In 1976, a spacecraft called Viking 2 began orbiting the planet Mars.

(a) The orbit of Viking 2 was the same as the orbit of a moon.

(i) Draw a labelled diagram to show how Viking 2 orbited Mars. **(2)**

(ii) Add a labelled arrow to the diagram to show the force that causes the spacecraft to orbit Mars. **(2)**



ResultsPlus
Examiner Comments

This response scored 1 mark for Mars being in the centre of the orbit. The decision to draw the diagram in 3D makes it impossible to judge the shape of the orbit. No attempt has been made to include the force that acts on Viking 2.

ResultsPlus
Examiner Tip

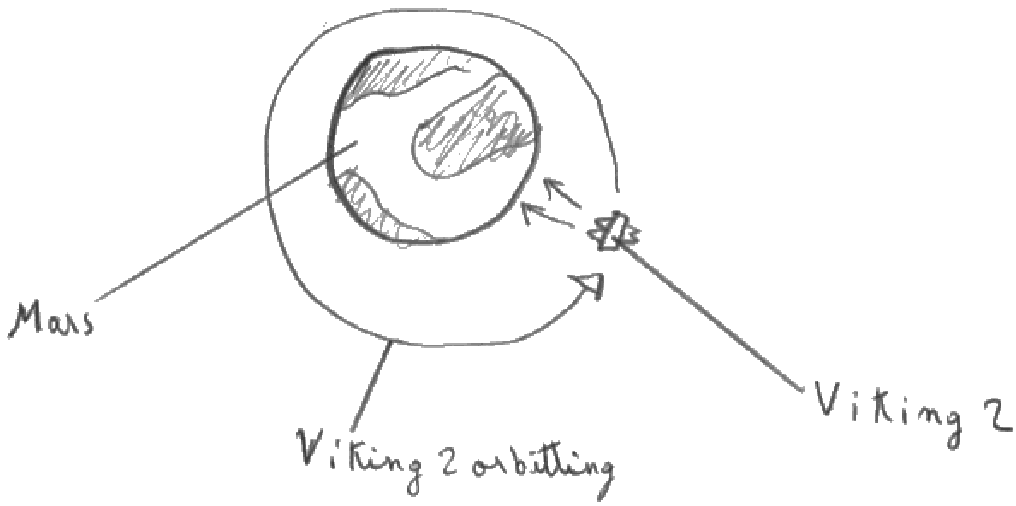
Candidates should be advised not to draw orbital diagrams in 3D.

2 In 1976, a spacecraft called Viking 2 began orbiting the planet Mars.

(a) The orbit of Viking 2 was the same as the orbit of a moon.

(i) Draw a labelled diagram to show how Viking 2 orbited Mars. **(2)**

(ii) Add a labelled arrow to the diagram to show the force that causes the spacecraft to orbit Mars. **(2)**



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Examiner Comments

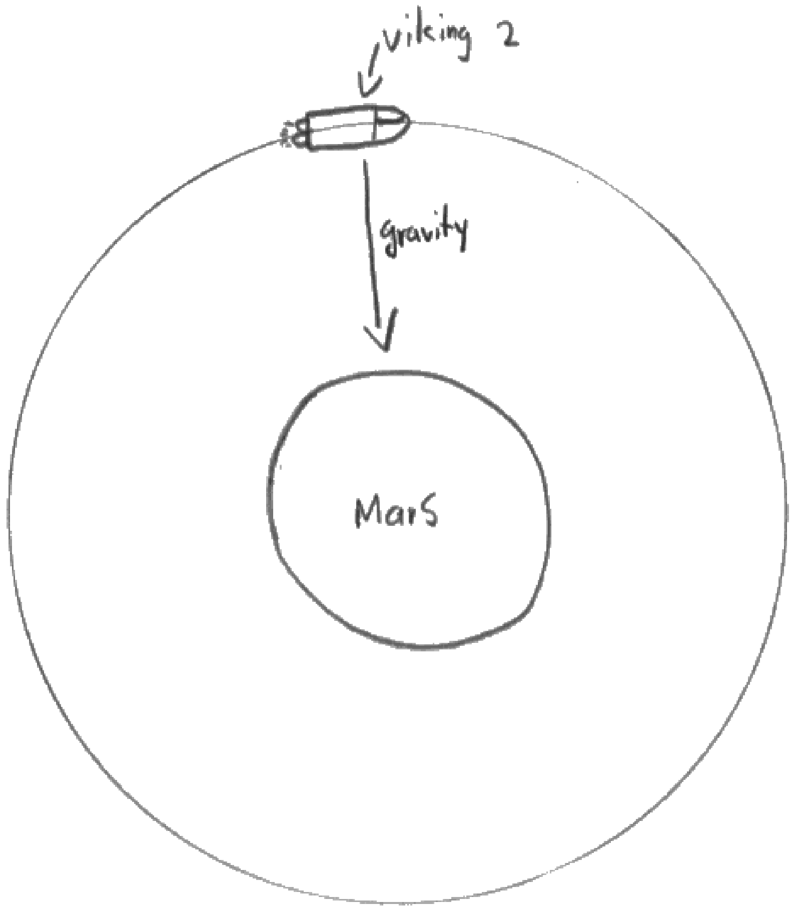
This response scored 1 mark in Q02(a)(i) and 1 mark in Q02(a)(ii). The orbit was judged to be circular, but Mars is not in the centre of the orbit. The two arrows directed from Viking 2 towards Mars were judged to be the force acting on Viking 2 and were awarded a mark, but they are not labelled to include the name of the force.

2 In 1976, a spacecraft called Viking 2 began orbiting the planet Mars.

(a) The orbit of Viking 2 was the same as the orbit of a moon.

(i) Draw a labelled diagram to show how Viking 2 orbited Mars.

(ii) Add a labelled arrow to the diagram to show the force that causes the spacecraft to orbit Mars.



ResultsPlus
Examiner Comments

This response has been drawn accurately and with care. It was awarded full marks.

Question 2 (b)(iii)

Most candidates answered this question incorrectly. Most common incorrect answers included the size of the planets, the distance from the sun, the lack of atmosphere on Mars, and often trying to state that it was because the gravity on Mars was less, thinking this was a separate point.

Question 2 (b)(i-ii)

It was encouraging to see more than half of all candidates successfully complete this calculation, although some of these lost a mark for not converting the units of weight from kilonewtons to newtons. Some candidates knew that they should convert the units of weight, but did so incorrectly. This still only resulted in losing a single mark. Weaker candidates scored less marks due to experiencing difficulties rearranging the formula. Surprisingly, nearly 20% of all candidates scored zero in this question despite the formula being given in the formula sheet.

(b) A landing vehicle was launched from Viking 2 when the spacecraft was in orbit.

On the surface of Mars, the landing vehicle had a weight of 2.1 kN.

(i) State the formula linking weight, mass and gravitational field strength, *g*.

(1)

weight = mass x gravitational field strength

(ii) The gravitational field strength on the surface of Mars is 3.7 N/kg.

Calculate the mass of the landing vehicle.

(3)

$W = m \times g$

$2.1 = m \times 3.7$

$\frac{2.1}{3.7} = m$

$0.568 = m$

mass = 0.568 kg

ResultsPlus
Examiner Comments

This response scored 2 marks in Q02(b)(ii). The candidate's working is presented very clearly, but they have not converted the units of weight into newtons.

ResultsPlus
Examiner Tip

Candidates should be familiar with the standard units for quantities that are used in calculations.

(b) A landing vehicle was launched from Viking 2 when the spacecraft was in orbit.

On the surface of Mars, the landing vehicle had a weight of 2.1 kN.

(i) State the formula linking weight, mass and gravitational field strength, *g*. **(1)**

weight = mass x gravitational field strength

W = mg

(ii) The gravitational field strength on the surface of Mars is 3.7 N/kg.

Calculate the mass of the landing vehicle. **(3)**

x1000

2.1 kN → N

= 2100N

2100N = m x 3.7N/kg

$\frac{2100}{3.7}$

= 567.57 kg

mass = 567.57 kg

ResultsPlus
Examiner Comments

This response was awarded full marks.

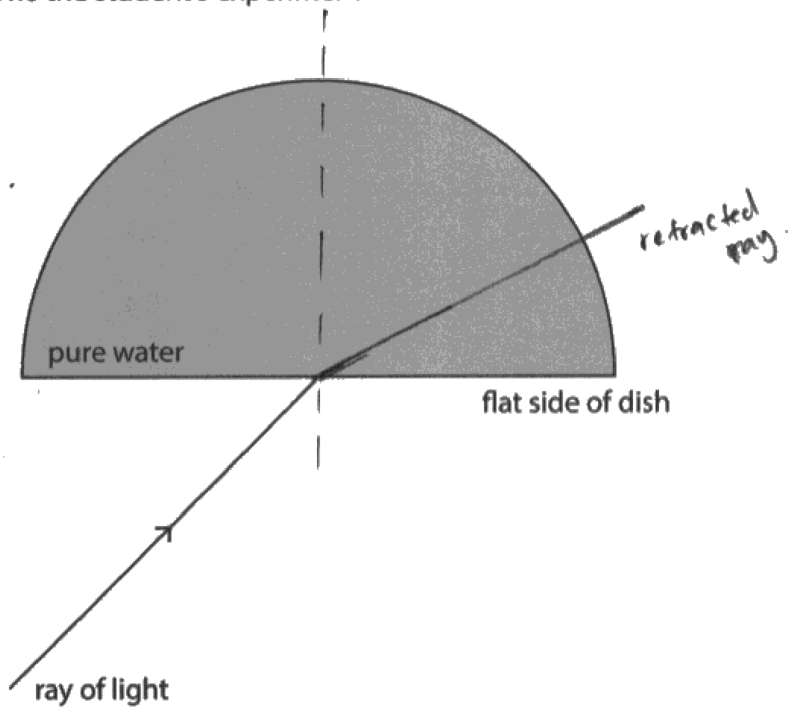
Question 3 (a)

Candidates found identifying the variables in this question challenging, but most were awarded at least 2 marks. It was common to see confusion between the independent, dependent and control variables.

Question 3 (b)

Most candidates scored 0 marks in these questions. However, slightly less than half of all candidates were able to score at least 1 mark for correctly drawing the normal line. Despite being told that the ray of light was refracted, many candidates drew reflected rays in addition to, or instead of, refracted rays, which showed confusion between these two types of wave behaviour. Of the candidates who drew a refracted ray, some measured the angle of refraction from the normal, which resulted in the ray bending in the wrong direction and zero marks being awarded.

(b) The diagram shows the student's experiment when the semicircular dish contains pure water.



(i) Draw the normal line where the ray of light hits the flat side of the dish.

(1)

(ii) The ray of light has an angle of refraction of 32.0° for pure water.

Draw the refracted ray of light.

(2)

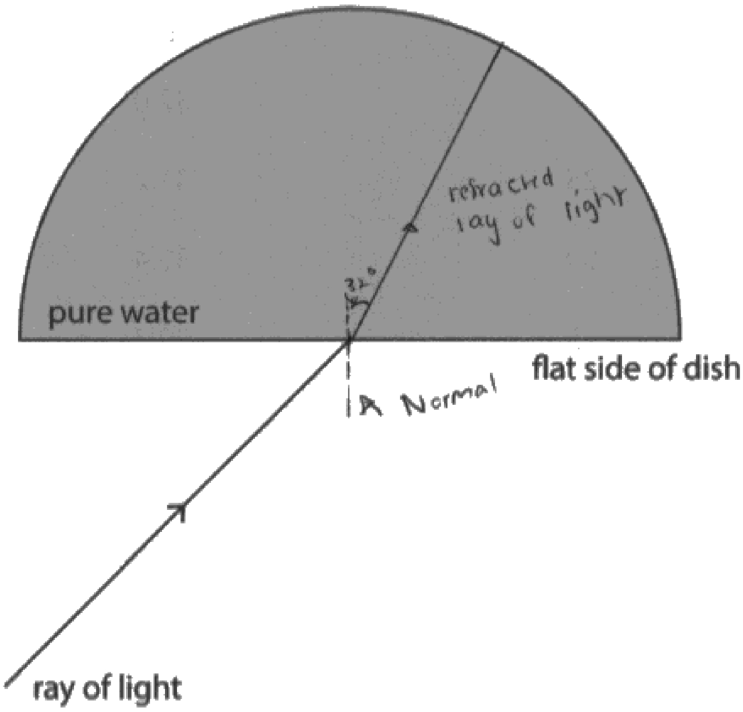
ResultsPlus
Examiner Comments

This response scored the mark for the normal in Q03(b)(i), but the refracted ray bends in the wrong direction so 0 marks were awarded in Q03(b)(ii).

ResultsPlus
Examiner Tip

Candidates should know that angles of incidence, refraction and reflection are measured from the normal line, not the boundary.

(b) The diagram shows the student's experiment when the semicircular dish contains pure water.



(i) Draw the normal line where the ray of light hits the flat side of the dish.

(1)

(ii) The ray of light has an angle of refraction of 32.0° for pure water.

Draw the refracted ray of light.

(2)

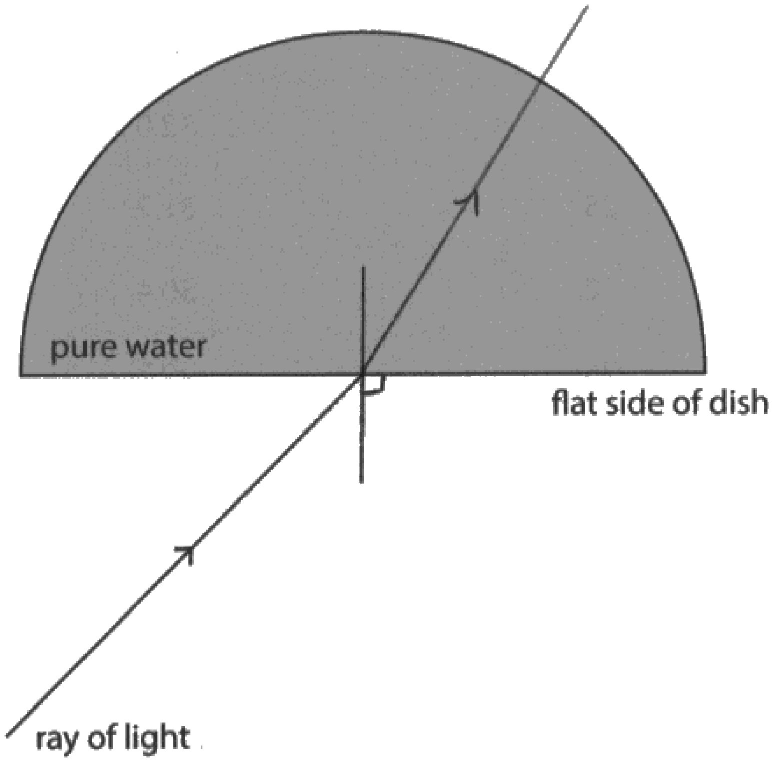
ResultsPlus
Examiner Comments

This response scored 1 mark in Q03(b)(i) and 1 mark in Q03(b)(ii). The refracted ray bends in the correct direction, but the angle of refraction has not been measured correctly by the candidate.

ResultsPlus
Examiner Tip

Candidates should bring a protractor with them when sitting examinations so they can measure angles accurately.

(b) The diagram shows the student's experiment when the semicircular dish contains pure water.



(i) Draw the normal line where the ray of light hits the flat side of the dish.

(1)

(ii) The ray of light has an angle of refraction of 32.0° for pure water.

Draw the refracted ray of light.

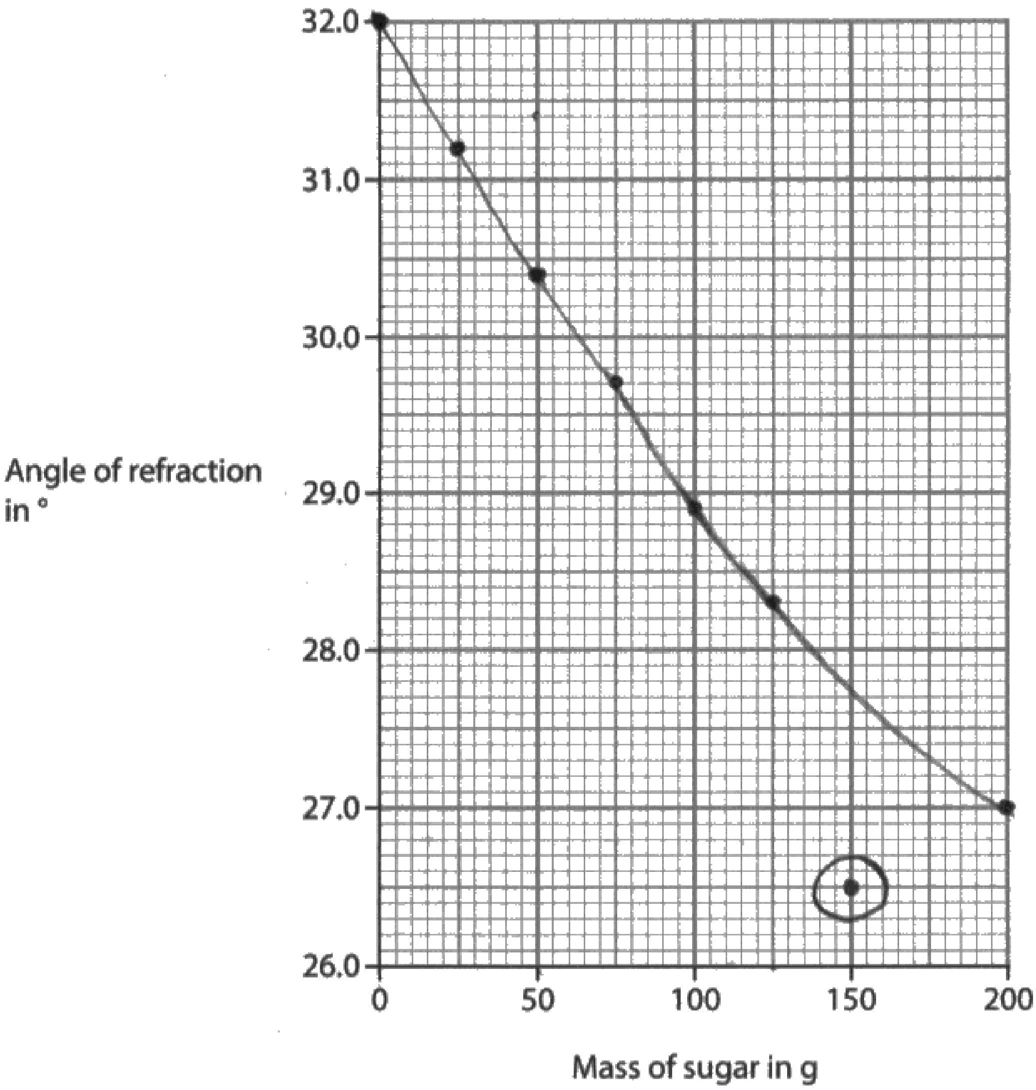
(2)

ResultsPlus
Examiner Comments

This response is correct and was awarded full marks.

Question 3 (c)(i-iii)

The graph drawing exercise in Q03(c)(i)-(iii) differentiated well between candidates, with an approximately equal distribution of marks in the range of 0-3. The vast majority of plotting was good with, for some reason, the last point being the one most commonly mis-plotted. Most candidates were familiar with the idea of anomalies and identified the correct one. The line of best fit was not generally completed well, with many candidates joining dots, including the anomaly.



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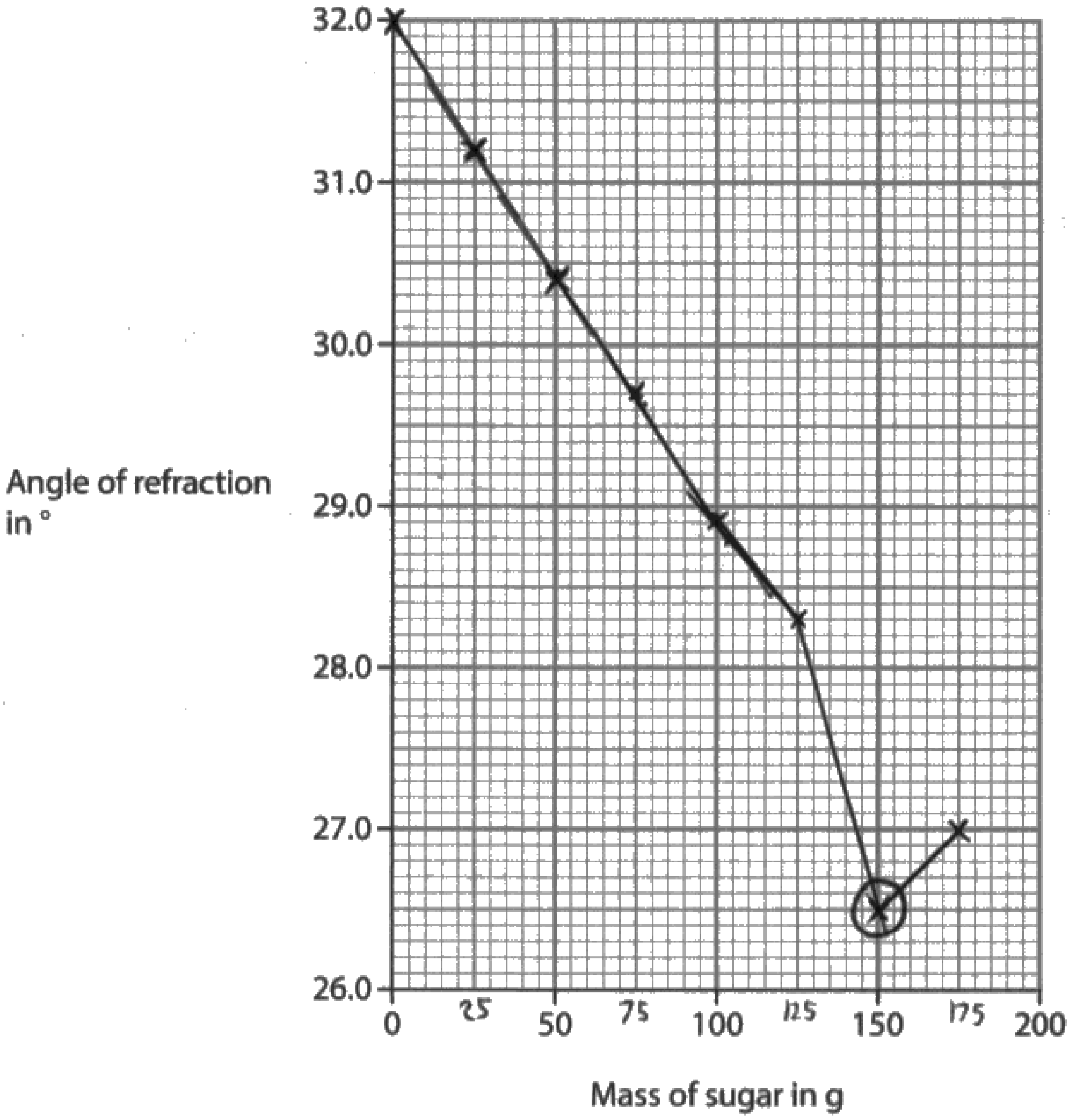
Examiner Comments

This candidate lost the mark in Q03(c)(i) for plotting the final data point incorrectly.



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Examiner Comments

This candidate lost the mark in Q03(c)(iii) as they have not drawn a curve. The data points (including the anomaly) have been joined by straight lines, which is incorrect.

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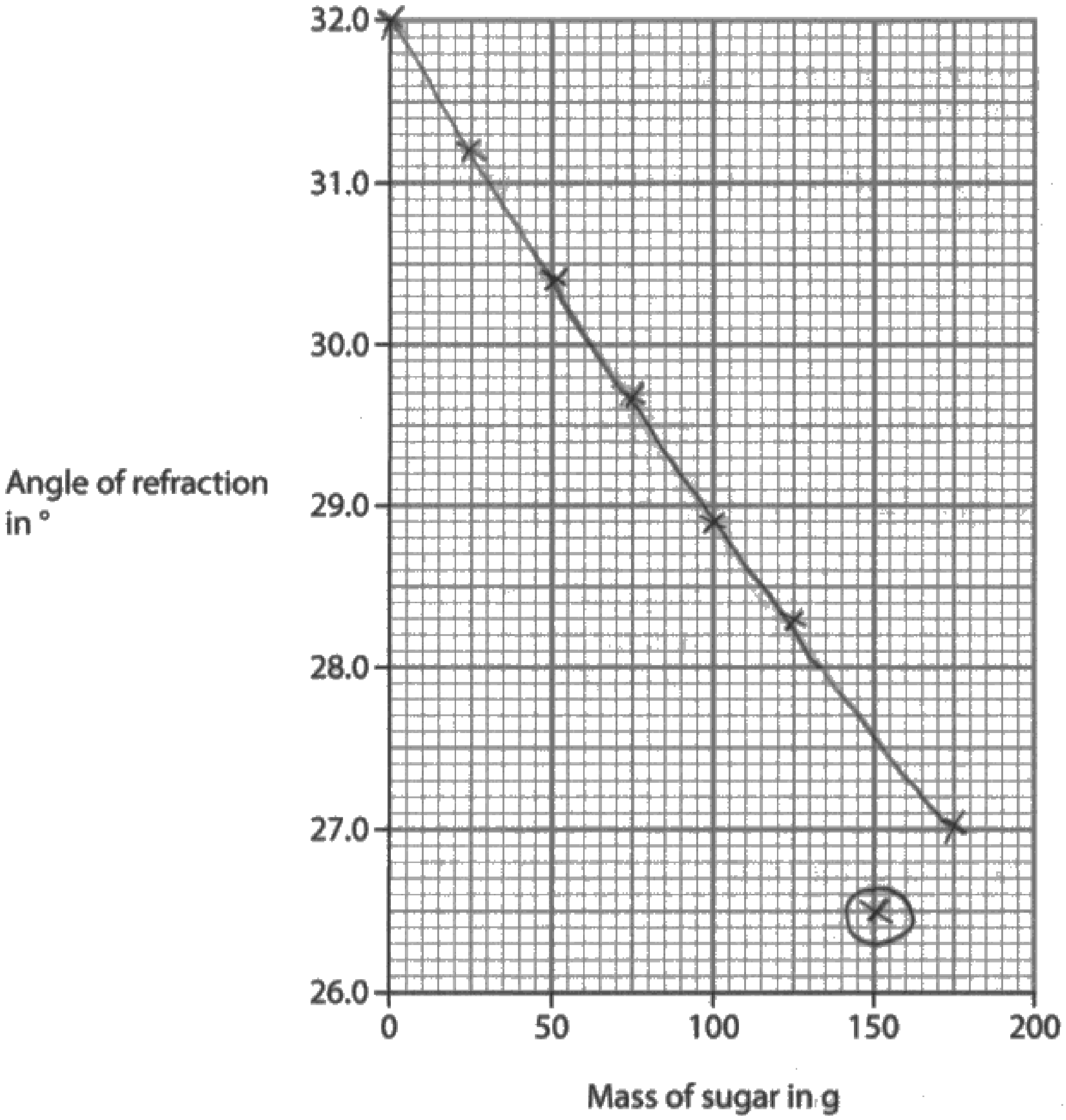
Examiner Tip

Candidates should read questions carefully. Q03(c)(iii) clearly asks for a curve to be drawn.



ResultsPlus
Examiner Comments

This response is correct and was awarded full marks.

Question 3 (c)(iv)

The majority of candidates scored at least 1 mark in this question for giving a simple pattern statement between the variables. More able candidates went further by stating that the relationship was non-linear, which gained a second mark.

(iv) Describe the relationship between the mass of sugar and the angle of refraction.

(2)

As the mass of sugar increase the angle of refraction decrease

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Examiner Comments

This response scored 1 mark. The candidate has given a simple pattern statement between the variables.

(iv) Describe the relationship between the mass of sugar and the angle of refraction.

(2)

As the mass of sugar increases, the angle of refraction decreases. There is a non-linear relationship.

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Examiner Comments

This response scored 2 marks. In addition to a pattern statement, the candidate has gained a further mark for describing the relationship as non-linear.

Question 4 (a)(i)

Less than a third of all candidates knew that the small particles in the diagram were neutrons.

Question 4 (a)(ii-iii)

Most candidates scored 0 marks in these questions. Some candidates gave answers that were the wrong way round, whilst others referred to energy being released, split, shared or divided. These responses were not credited. Some candidates scored a single mark for stating that both energy stores increased or both energy stores decreased.

Question 4 (b)(i)

It was encouraging to see many candidates score at least 1 mark in this question. This was usually for the idea that the concrete acted as shielding and stopped the radiation from escaping from the reactor. More able candidates scored a further mark for recognising that the gamma radiation could be harmful to humans. Only the most able candidates scored MP1 by recognising that the high penetration ability of gamma radiation necessitated such thick shielding.

(b) In a power station, nuclear fission can be used to generate electricity.

Some of the daughter nuclei produced in fission are highly radioactive and emit gamma radiation.

(i) In a power station, nuclear fission takes place inside a nuclear reactor.

Explain why nuclear reactors are surrounded with thick layers of concrete.

(3)

Gamma radiation is highly penetrating, therefore the thick layer of concrete stop the ~~radiation~~ ~~ioni~~ radiation to escape and cause harm to the closeby humans, which can result in cancer for human if met with gamma rays.

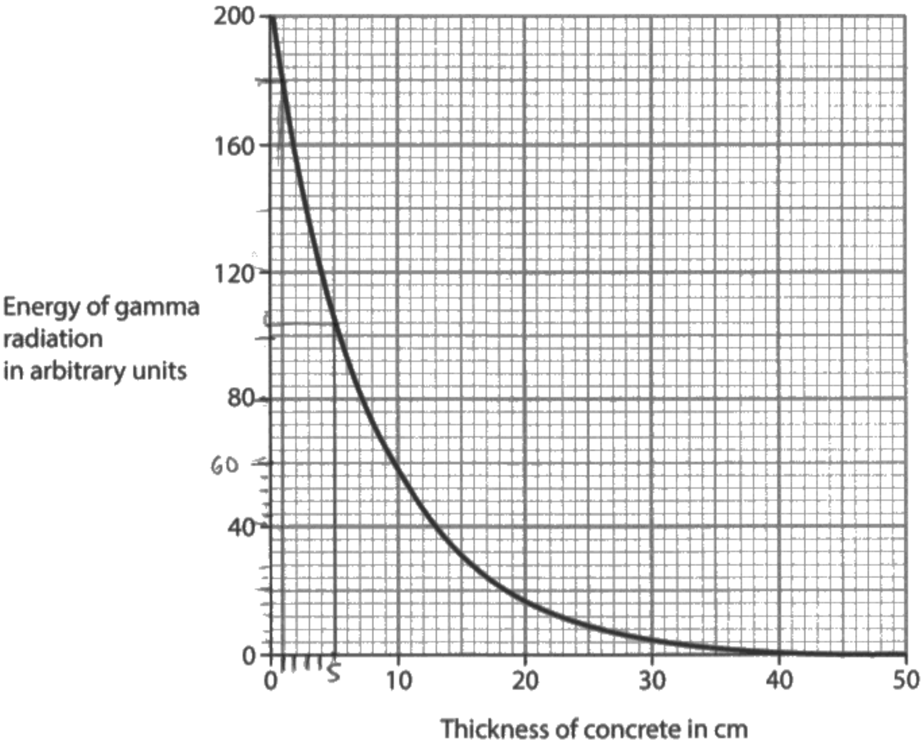
ResultsPlus
Examiner Comments

This response was awarded 3 marks. The candidate has given a sufficient, albeit concise, explanation of why thick layers of concrete are used.

Question 4 (b)(ii)

Most candidates scored 0 marks in this question. Some attempted a half-life determination from the graph, with lines drawn on from 100 and down to the thickness. Others went in at 90, perhaps just using the number given without trying to calculate the percentage. Most correct answers went down the route of calculating 90% of 200, and then subtracting it from 200, rather than a direct 10% calculation.

(ii) The graph shows the energy of gamma radiation that passes through different thicknesses of concrete shielding.



Determine the thickness of concrete needed to reduce the energy of gamma radiation by 90 %.

(3)

~~200 − 110 = 90~~

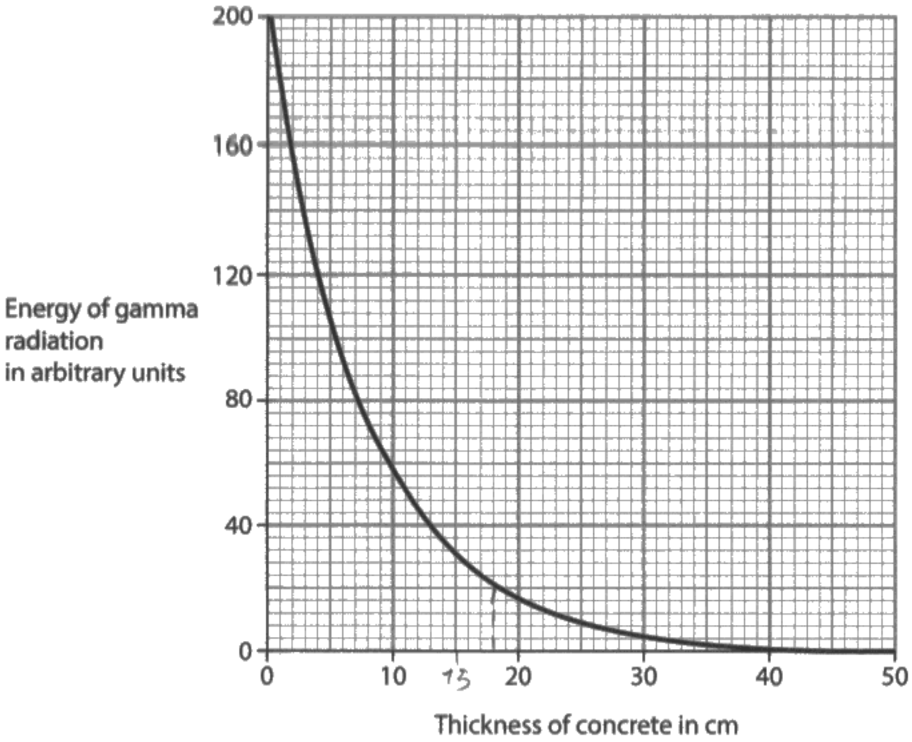
$\frac{180}{200} \times 100 = 90\%$

thickness = 1 cm

ResultsPlus
Examiner Comments

This response scored 2 marks. The candidate has misinterpreted the question and determined the thickness needed to reduce the energy *to* 90%, rather than *by* 90%.

(ii) The graph shows the energy of gamma radiation that passes through different thicknesses of concrete shielding.



Determine the thickness of concrete needed to reduce the energy of gamma radiation by 90 %.

(3)

$\frac{180}{200} \times 100 = 90\%$

$200 - 180 = 20$

thickness = 17, 5 cm

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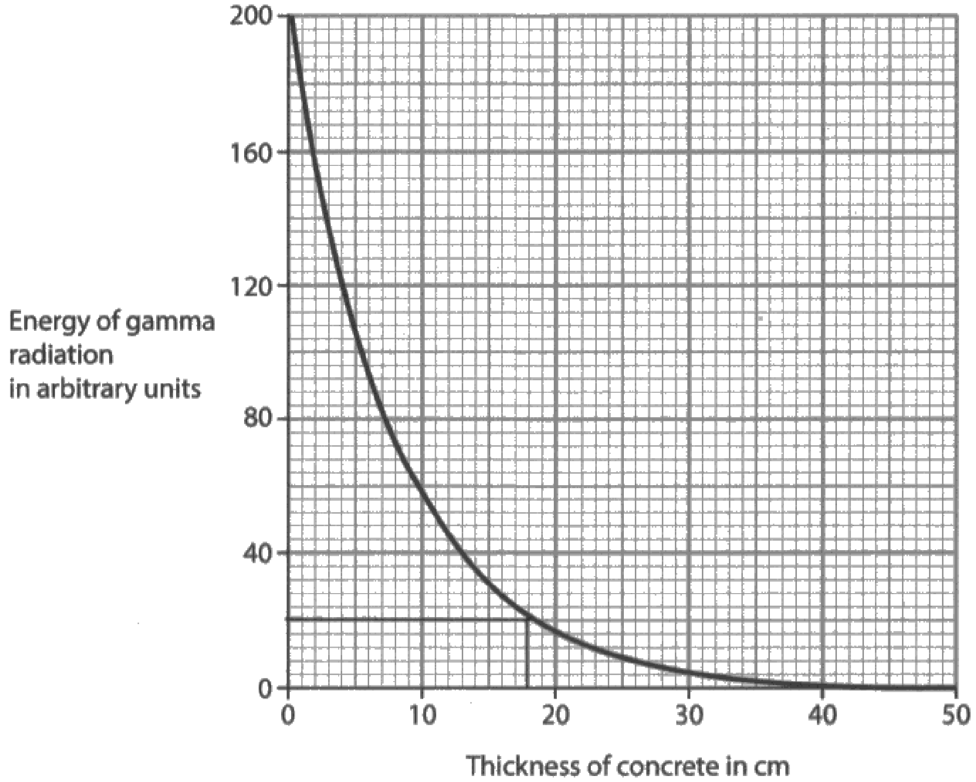
Examiner Comments

This response also scored 2 marks. The candidate has understood the question, but has misread the scale on the x-axis to give a thickness that was outside the allowed range of values.

(ii) The graph shows the energy of gamma radiation that passes through different thicknesses of concrete shielding.



Determine the thickness of concrete needed to reduce the energy of gamma radiation by 90 %.

(3)

90% of gamma = 200 x 90%
= ~~200~~-180
= 20

Thickness of concrete = 18

thickness = 18 cm

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This response is fully correct and was awarded 3 marks.

Question 5 (a)

Approximately half of all candidates gave a suitable name for force X. Incorrect responses were usually one of:

- weight (or other wording that implies the same)
- braking force
- wind resistance or air force
- resistance

Question 5 (b)(iii)

Most candidates scored at least 1 mark in this question. The (lack of) effect on the thinking distance was generally not well understood. Even candidates who knew the thinking distance would remain the same often didn't reference the reaction time as the reason for no change. The braking distance was much more commonly answered correctly, with a variety of responses to describe the difference in 'grip' but most having the correct idea.

Question 5 (b)(i-ii)

Candidates found this question very challenging and most scored either 0 marks or 1 mark for determining the correct reaction time in Q05(b)(i). Most candidates did not know that they should evaluate an area in Q05(b)(ii) to determine the stopping distance. More able candidates scored at least 2 marks in Q05(b)(ii) for calculating either the thinking distance or braking distance correctly. Those candidates who knew to calculate both the thinking distance and braking distance and then add them together often scored 3 marks, but only when their working showed this clearly.

(i) Determine the reaction time of the driver.

(1)

reaction time = 0.6 s

(ii) Calculate the total stopping distance of the car.

(4)

stopping distance = thinking distance + braking distance.

$\frac{1}{2} \times b \times h$

$\frac{1}{2} \times 4 \times 26 = 52$

stopping distance = 52 m

ResultsPlus Examiner Comments

This response scored 1 mark in Q05(b)(i) and 2 marks in Q05(b)(ii). The candidate has correctly calculated the braking distance, but the thinking distance has not been included in the calculation.

(i) Determine the reaction time of the driver.

(1)

reaction time = 0.6. s

(ii) Calculate the total stopping distance of the car.

(4)

thinking distance = 0.6 × 26 = 15.6 m //

breaking distance = ½ × 5.0 × 26 = 65 m //

65 + 15.6 = 80.6 //

stopping distance = 80.6 m

ResultsPlus
Examiner Comments

This response scored 1 mark in Q05(b)(i) and 3 marks in Q05(b)(ii). The candidate has correctly calculated the thinking distance, but a mistake has been made when calculating the braking distance. However, their working is clear enough to award an additional mark for adding together their thinking distance and braking distance values.

(i) Determine the reaction time of the driver.

(1)

reaction time = 0.6 s

(ii) Calculate the total stopping distance of the car.

(4)

Thinking distance + Braking distance = Safe stopping distance

0.6×26
Thinking distance = 15.6m

braking distance = $4 \times 26 \times \frac{1}{2}$
= 52m

= 52m + 15.6m
= 67.6m

stopping distance = 67.6 m

ResultsPlus
Examiner Comments

This response is correct and was awarded full marks.

Question 6 (a)(i)

A small fraction of candidates limited themselves by only mentioning one point that the diagram showed about the motion of the particles. Therefore they were unable to gain full marks. Common statements that were seen in responses that scored 0 marks included:

- Particles move freely around unrestricted.
- Particles collide with the walls of the container and each other.
- Particles have lots of space to move in/not closely packed together.
- Particles move at different velocities.

The points made were all true, but not relevant to answering the question, i.e. what the different arrows represented. It might be that the candidates who scored zero, mistakenly chose not to focus their answer on the arrows because the question already stated the arrows represent the velocities of the gas particles.

Out of the candidates who scored 1 it was much rarer to see different speeds in responses, compared to different directions. So the candidates found it more challenging to work out what the different length arrows meant.

Question 6 (a)(ii)

Most candidates were able to describe the collisions with the walls, but few related this to the existence of a force. Some candidates attempted to describe an increase in pressure due to temperature change, but still mentioned the correct marking points.

(ii) Explain how the gas particles exert a pressure on the walls of the container.

(2)

the particles exert a pressure and bounce off the walls

ResultsPlus
Examiner Comments

This response scored 1 mark for the reference to the particles colliding with the walls. The candidate does not develop this idea any further.

(ii) Explain how the gas particles exert a pressure on the walls of the container.

(2)

- Gas particles moves in random motion.
- So that they collide with the walls of the container
- So when this happens this exerts a force, according to the formula ($P = \frac{F}{A}$), this exerts a pressure too.

ResultsPlus
Examiner Comments

This response scored 2 marks. The candidate states that particles collide with the walls and then develops this idea further by linking this to the existence of a force.

Question 6 (b)(i)

This calculation was intentionally challenging and most candidates scored 0 marks. Candidates found rearranging the formula very difficult, whilst others used incorrect values from the table of data. Some candidates experienced difficulties when working with numbers in standard form, which perhaps indicated an inability to use a calculator correctly when entering standard form numbers.

(b) The table gives information about particles in a different sample of gas. $7.3\times10^{-26} \rightarrow 9.8\times10^{-21}$

$x \rightarrow 1.2\times10^{4}$

Mass of one gas particle	7.3×10^{-26} kg
Mean kinetic energy of one gas particle	9.8×10^{-21} J
Total mean kinetic energy of gas particles	1.2×10^{4} J

(i) Calculate the mean speed of the particles in this gas sample.

[kinetic energy = ½ × mass × speed²]

(3)

$KE = \frac{1}{2}mv^2$

$v = \sqrt{\frac{2KE}{m}} \longrightarrow = \sqrt{\frac{2\times(1.2\times10^{4})}{7.3\times10^{-26}}}$

~~$2\times(9.8\times10^{-21})$~~ $= 5.7\times10^{14}$

mean speed = 5.7×10^{14} m/s

ResultsPlus
Examiner Comments

This response scored 2 marks. The candidate has used the formula correctly, but has selected the incorrect value of kinetic energy from the data table.

(b) The table gives information about particles in a different sample of gas.

Mass of one gas particle	7.3×10^{-26} kg
Mean kinetic energy of one gas particle	9.8×10^{-21} J
Total mean kinetic energy of gas particles	1.2×10^{4} J

(i) Calculate the mean speed of the particles in this gas sample.

[kinetic energy = ½ × mass × speed²]

(3)

$9.8 \times 10^{-21} = \frac{1}{2} \times 7.3 \times 10^{-26} \times speed^2$

$\frac{9.8 \times 10^{-21}}{3.65 \times 10^{-26}} = v^2$

$v = \sqrt{\frac{9.8 \times 10^{-21}}{3.65 \times 10^{-26}}} = 518.16$ m/s

mean speed = 518.16 m/s

ResultsPlus
Examiner Comments

This response is correct and was awarded 3 marks.

Question 6 (b)(ii)

Most candidates did not know where to start with this calculation. Many simply multiplied the mass of one gas particle by 5, presumably because the diagram on the previous page showed 5 gas particles. Correct answers were obtained either by a method of ratios or by using the kinetic energy formula again, but using the value for the total kinetic energy of the gas and their speed calculated in Q06(b)(ii).

Paper Summary

Based on their performance on this paper, candidates should:

- Take note of the number of marks given for each question and use this as a guide as to the amount of detail expected in the answer.
- Take note of the command word used in each question to determine how the examiner expects the question to be answered, for example, whether to give a description or an explanation.
- Be able to rearrange the formulae listed in the specification.
- Know the SI units for physical quantities and be able to convert from non-SI units to SI units when required.
- Show all working, so that some credit can still be given for answers that are only partly correct.
- Take advantage of opportunities to draw labelled diagrams as well as, or instead of, written answers.
- Take care when drawing diagrams to do so accurately and with labels.

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