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Examiners' Report

June 2016

GCSE Design & Technology: Electrics 5EP02 01

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June 2016

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Introduction

The paper this year followed the now very familiar structure which helped to facilitate access to candidates from across the ability range. Almost all candidates tended to perform better in questions which required them to recall knowledge and it is clear that they were well prepared in general. Candidates found questions which required them to expand upon their initial response more difficult and these tended to differentiate between stronger and weaker candidates.

The multiple choice questions allowed all candidates access to marks. Many scored 9 or 10 marks here and most were able to identify half, or more, of the answers correctly. Candidates found the last three multiple choice questions more difficult and these helped to reward better prepared candidates.

Candidate performance within the extended answer questions, 13d and 14e, was often poor. These questions served well to differentiate stronger candidates. The level based marking scheme was applied which rewards candidates who address the question correctly and can articulate extended arguments. QWC was also assessed here.

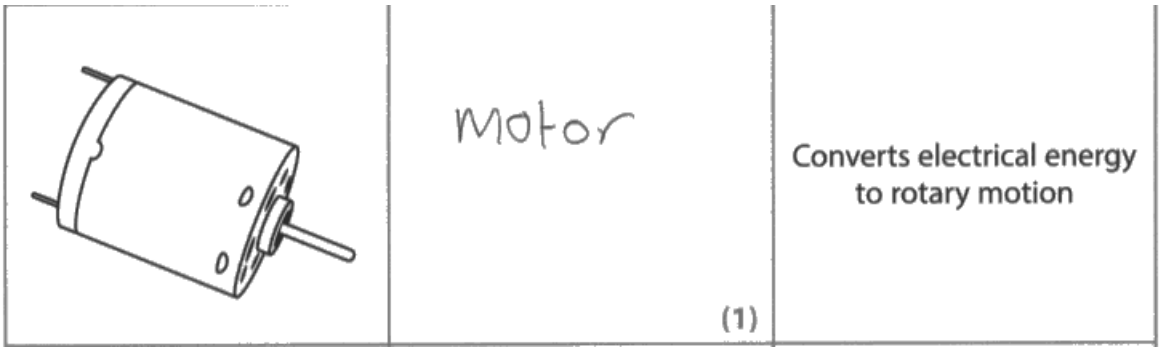
Some candidates struggled to communicate effectively and it is important to encourage candidates to write clearly and legibly. While graphical communication is not assessed in the design question it is also important for candidates to be able to express their ideas and some were disadvantaged by poor communication skills. These questions often require them to 'show' their design decisions and frequently it is not appropriate to communicate these features through annotation alone.

Question 11 (a)(i)

Most candidates recognised that the LDR was a light sensor. Stronger candidates went on to explain the function of the LDR referencing varying resistance in response to changes in light intensity.

Question 11 (a)(ii)

Most candidates correctly identified this component as a motor or in some cases as a DC motor. A small minority incorrectly provided the answer as 'rotary switch'.



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Examiner Tip

It is important to read the question carefully and to digest all the information.

Question 11 (a)(iii)

There were few incorrect answers for this question. Most candidates submitted 'cutting wires' as an answer.

	Side cutters	use to cut the wires (1)

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Examiner Comments

Answers such as 'cutting materials/metal' were not credited.

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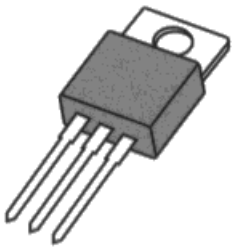
Examiner Tip

It is often important to identify specific applications when facing questions like this.

Question 11 (a)(iv)

Many candidates failed to identify the thyristor. Most incorrect answers identified the component as a voltage regulator or transistor.

	Voltage Regulator ~~Transis~~ (1)	Latches a circuit output

ResultsPlus
Examiner Comments

Candidates should be encouraged to read and process all the information provided within the question. It is important not to rely on the picture alone.

ResultsPlus
Examiner Tip

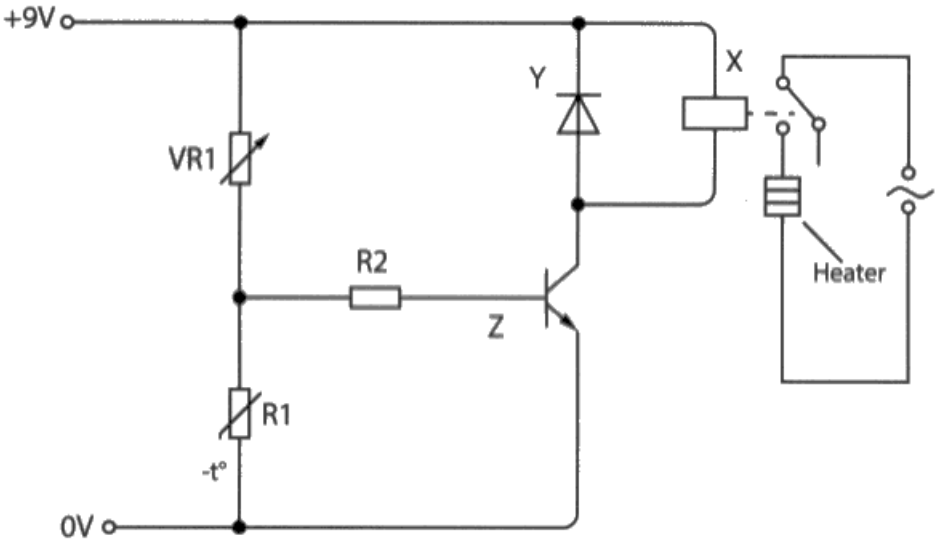
Many different components are contained in identical cases. You need to look carefully at the description in questions like this.

Question 11 (b)(i)

This was an early question and a wide range of responses were credited including 'Thermistor', 'R1', 'VR1' or 'Variable resistor'. However, a significant number of candidates were unable to provide a correct answer.

(b) A company manufactures automatic heaters.

The diagram below shows the circuit which will be used.



(i) Name **one** input component in the circuit.

(1)

Battery cell 9v

ResultsPlus
Examiner Comments

Some students attempted, incorrectly, to submit the power source as an input.

ResultsPlus
Examiner Tip

It is always safer to provide the technical name of a component, such as 'Thermistor' in a 'Name' question like this.

Question 11 (b)(ii)

Most candidates failed to recognise the relay as an output component. Common incorrect answers referred to the battery, transistor, diode and even an LED or heater.

(ii) Other than the heater, name **one** output component in the circuit.

(1)

LED

This candidate refers to a component which is not in the circuit and maybe confusing the diode with an LED.

ResultsPlus
Examiner Comments

It is important for candidates to be able to recognise the IEEE standard electronic symbols for components listed in the specification. They should also be able to place these components into the appropriate input, process or output categories.

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Examiner Tip

When revising use the official Edexcel 'Symbols and formulae sheet' available from the Edexcel website.

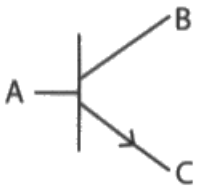
Question 11 (b)(iii)

Most candidates were able to correctly identify the transistor legs in the diagram. However, some confused the transistor with a FET or thyristor.

(iii) The circuit contains a process component Z. The three legs of component Z are labelled. Leg A has been named for you.

Give the names of the remaining two legs.

(2)



A base

B anode

C collector

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Examiner Comments

This candidate has confused the one leg with that from a thyristor and has written a correct answer in the wrong answer space. No marks could be credited.

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Examiner Tip

It is important to learn the names for the legs of transistors, FETs and thyristors.

Question 11 (c)

Understanding was important here. Many candidates attempted to guess. The question required an explanation of the role and/or function of the relay with reference to, for example, the relationship between the two circuits, the use of dual power supplies, the operation of the coil and/or the electro-magnetic switching action of the relay.

(c) Explain the function of component X in the circuit. relay

(2)

The relay (*) allows the DC - powered control circuit to operate the mains powered heater circuit without the two circuits touching - increasing safety and allowing the Heater to run on AC mains power.

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Examiner Comments

This answer exhibits a very good understanding of the function of a relay, attracting 2 marks.

ResultsPlus
Examiner Tip

It is important to expand upon your initial point in an 'Explain' answer.

(c) Explain the function of component X in the circuit.

(2)

To transfer energy over to the heater circuit, and vice versa.

ResultsPlus
Examiner Comments

This answer shows limited understanding implying that the relay supplies energy between the two circuits. It implies, incorrectly, that 'energy' is passed from the primary to secondary circuits. 0 marks awarded.

Question 11 (d)(i)

Most candidates managed to identify the diode. A few candidates confused this component with a thyristor or LED. This was the most common mistake.

(d) (i) Name component Y in the circuit.

(1)

Thyristor

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Examiner Comments

This response confuses a thyristor with the diode. 0 marks awarded.

ResultsPlus
Examiner Tip

Some of your examination preparation time could be used to revise these components and their symbols which are referenced frequently in the examination.

Question 11 (d)(ii)

This question elicited many good responses. It asked students to make the link between back EMF generated by the relay coil and damage to the transistor. Incorrect answers sometimes appeared to identify the symbol as a fixed resistor. It was important for candidates to identify the function of the relay within this particular circuit. Candidates should be encouraged to refer to diagrams carefully which are the subject of the question.

(ii) Explain what could happen if component Y was not used in this circuit?

(2)

There could be back EMF, which could damage the relay.

ResultsPlus
Examiner Comments

This answer correctly identifies back EMF as the problem, attracting 1 mark, but identifies the vulnerable component as the relay, showing a limited understanding of the role played by the diode.

ResultsPlus
Examiner Tip

Make sure you can describe component function accurately.

(ii) Explain what could happen if component Y was not used in this circuit?

(2)

If component Y, diode (clamping diode) was not there, then Back EMF would've damaged the semi conductor, which in this case is an npn transistor.

ResultsPlus
Examiner Comments

This answer was a detailed response which demonstrates a high level of understanding, linking the generation of back EMF and potential damage to the transistor. 2 marks awarded.

ResultsPlus
Examiner Tip

Make sure you look back at the circuit diagram in questions like this.

Question 11 (e)

Most candidates managed to acquire some marks here. Answers which attracted 3 and 4 marks, however, were scarcer. Testing was referenced in the stem so credit could not be awarded unless candidates explained 'how' circuits could be tested and benefits were explained. For the second mark we were looking for more technical references to 'simulation', 'experimentation' or 'virtual instruments' for example.

(e) When this circuit was designed, it was tested using circuit design software on a computer.

Explain **two** advantages of using circuit design software to test this circuit.

(4)

Advantage 1

An advantage of using a circuit design software is that you can make edits much more quickly and early, as it requires only to change the components. If you tested on an actual circuit, you'd need to unsolder first and then replace on a program.

Advantage 2

A circuit design software can simulate any faults that may occur in the circuit, without breaking any actual components. Testing with actual circuits may break components if there are faults. No components are wasted.

ResultsPlus
Examiner Comments

This answer provides 2 advantages which are expanded to provide an explanation. The focus is on testing. Advantage 2 is stronger as it provides a technical explanation explaining how faults can be 'simulated' without the need to damage real components. 4 marks awarded.

Candidates should be encouraged to expand their answers using technical vocabulary where they can. 2 mark 'Explain' questions require students to provide 2 linked points.

ResultsPlus
Examiner Tip

Try to use appropriate technical terms where you can.

Question 11 (f)

This question normally elicited responses which made the link between lower wages and reduced manufacturing costs.

(f) The circuit has been manufactured in China instead of the UK.

Explain **one** advantage for the manufacturer of producing the circuit in China.

(2)

labour costs may be cheaper, therefore it will cost less to make. there are also less health and safety precautions which also lower the cost or less protection is needed.

ResultsPlus
Examiner Comments

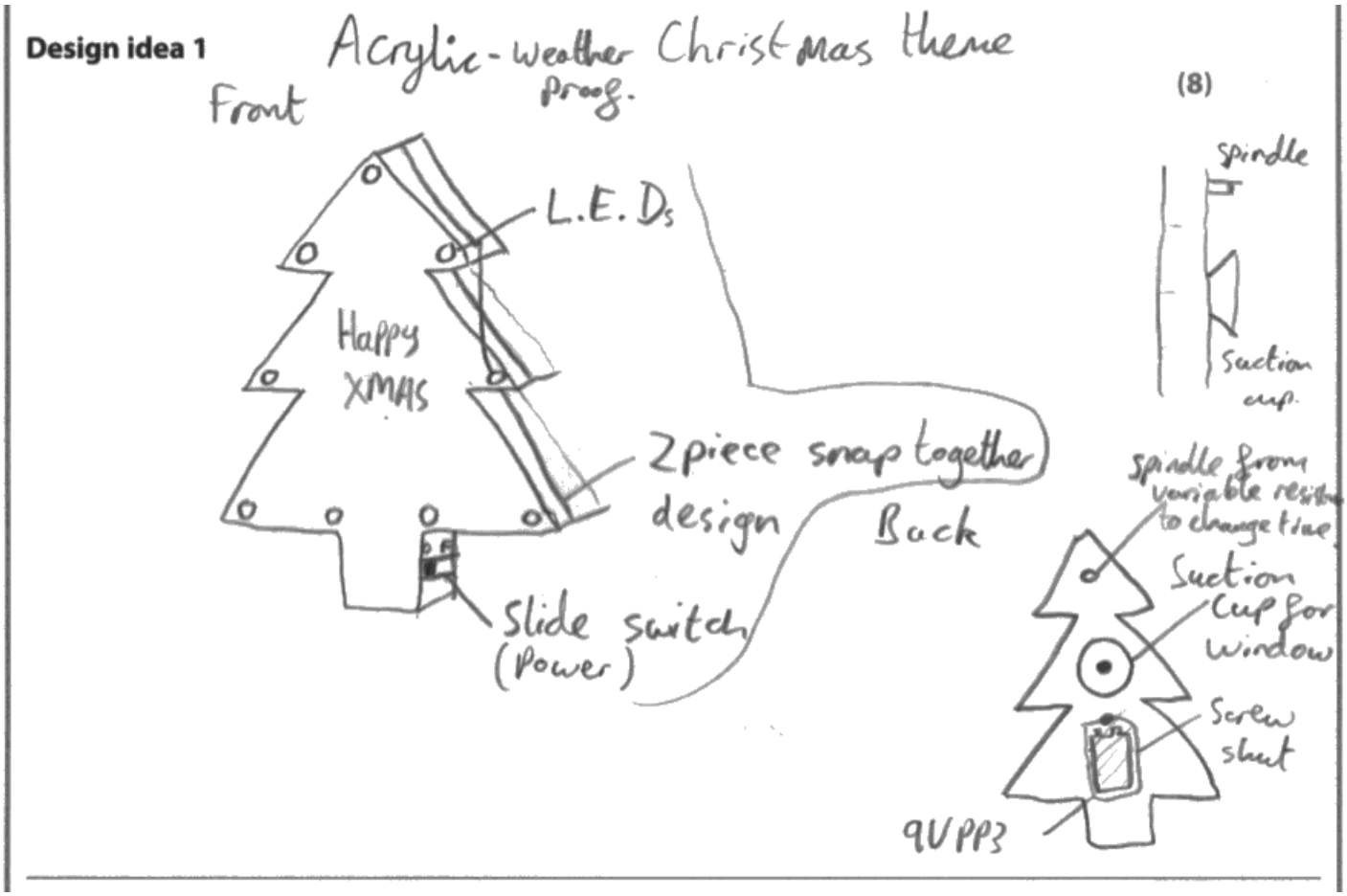
This response demonstrates a good understanding of the issues and goes on to explain why labour costs are reduced with reference to lower health and safety requirements. 2 marks awarded.

ResultsPlus
Examiner Tip

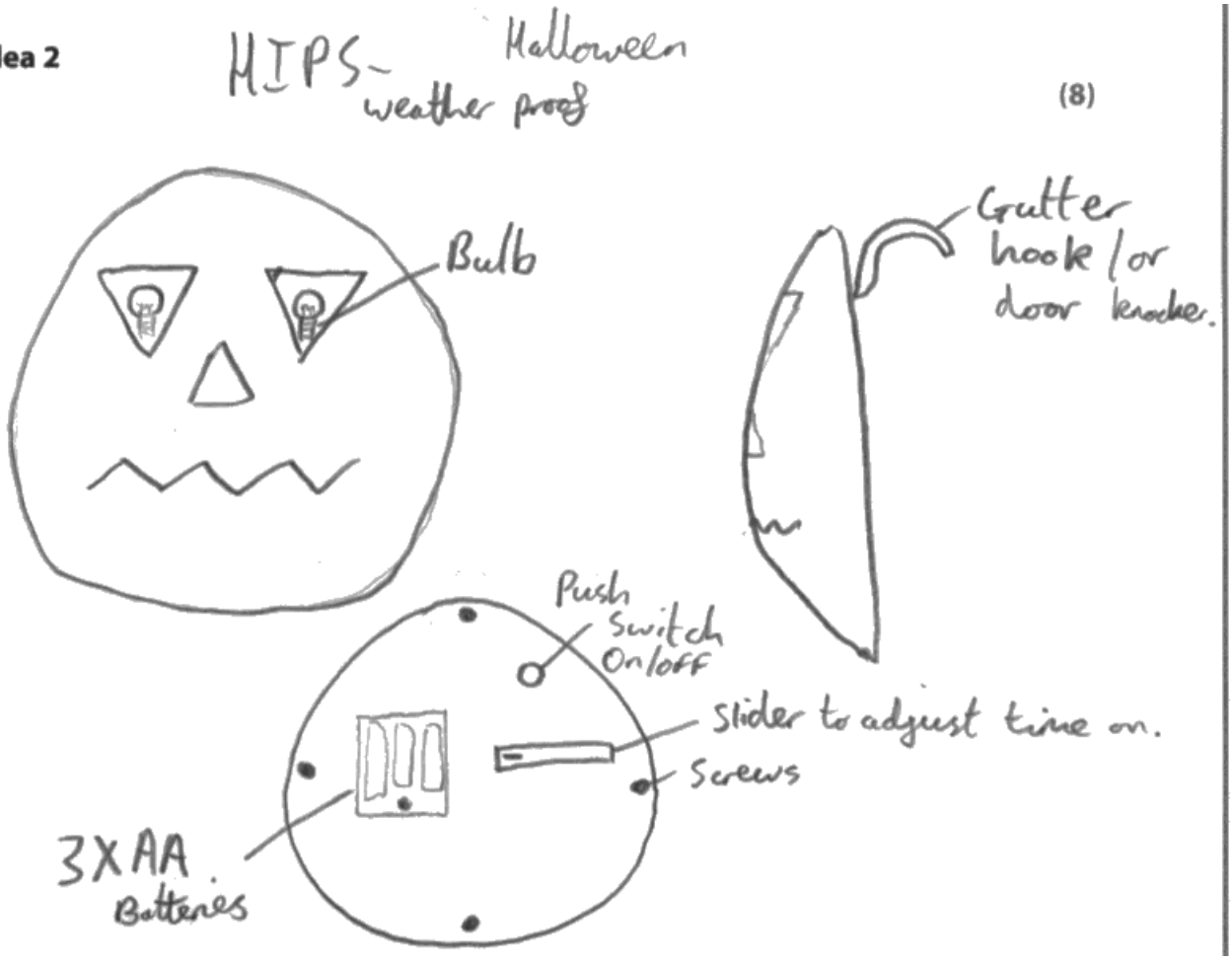
It does not hurt to go on to 'explain your explanation' to make doubly sure that you attract the highest marks.

Question 12

A large proportion of the cohort performed well in the design question and had clearly been well prepared. It was important for candidates to 'show' their design solutions for each of the specification points. The addition of supplementary views often helped them to communicate ideas. Labels alone often failed to attract credit. It was also important for candidates to refer to specific components by name. Many successful responses used a tick list against the specification points on the previous page to ensure that they had applied each design criterion to each of their design solutions. When candidates went on to reference the specification by 'numbering' each of their eight annotation points it was easier for examiners to identify evidence in support of marks. When candidates used similar components such as different coloured LEDs they could only be credited in one of the ideas.



Design idea 2



This is a very clear and strong response. The use of additional sketches helps to 'show' each design solution. Idea one has a clip together case and the two halves are shown clearly but it would have been nice to see a little more detail in support of this feature. Idea 2 shows alternative solutions for each specification point but again it would have been helpful to show more detail for the screw on back panel.

ResultsPlus
Examiner Comments

Labelled features which are not 'shown' will rarely be credited.

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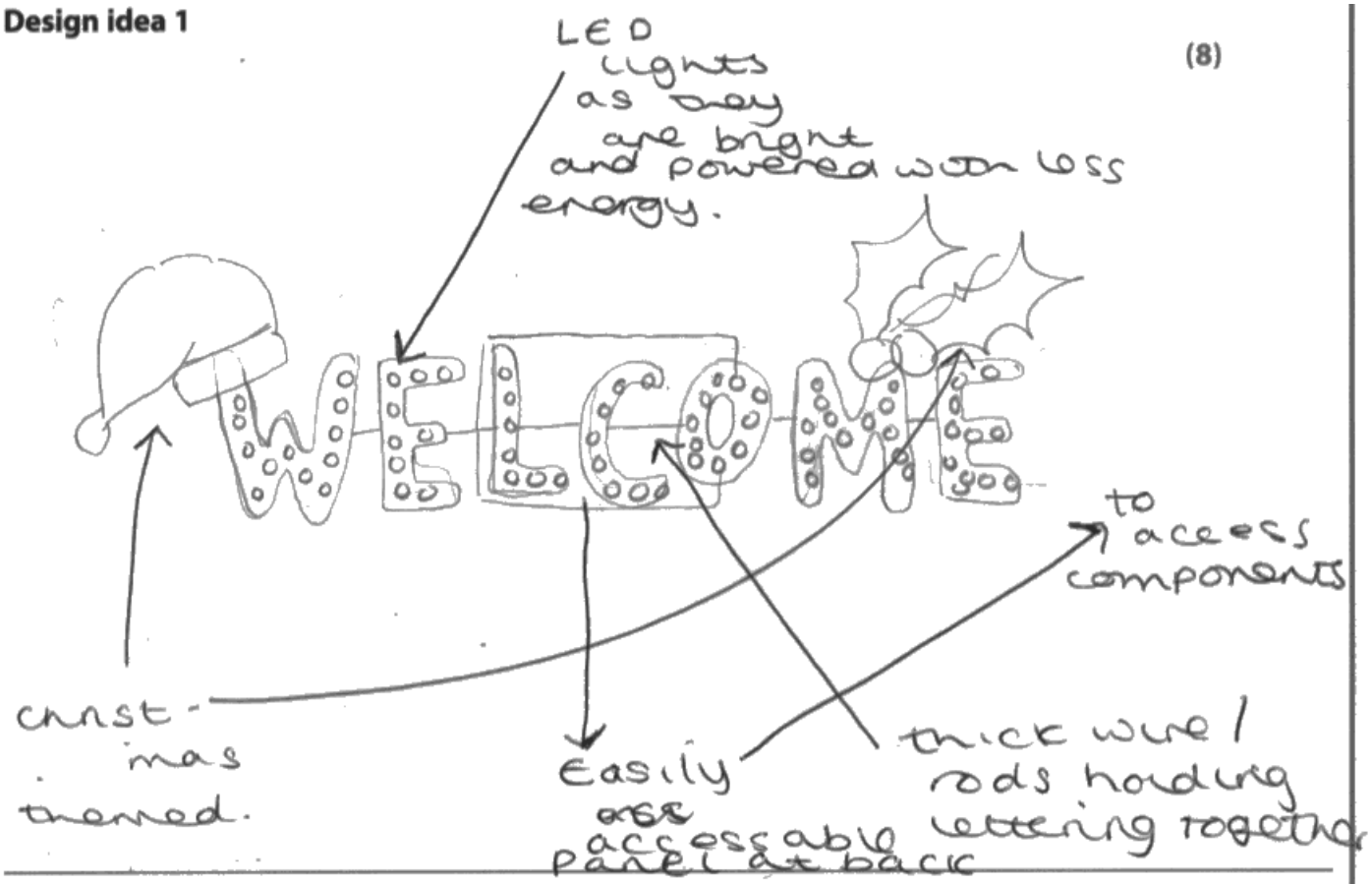
Examiner Tip

Use different views to help to explain your ideas.

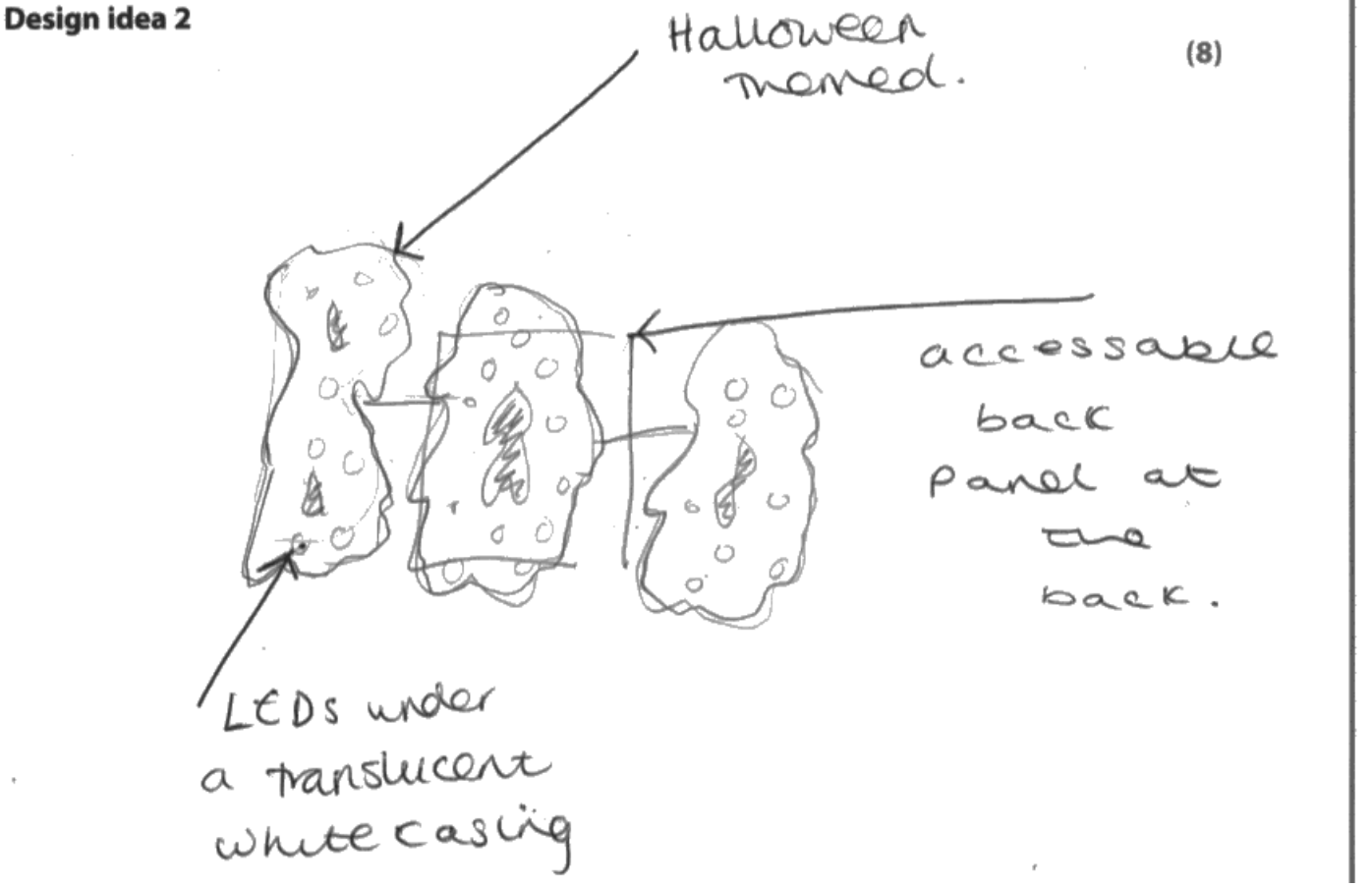
Design idea 1

(8)



Design idea 2

(8)



ResultsPlus

Examiner Comments

This response struggles to attract any credit. Design solutions for each specification point are not shown and the candidate does not address all of the specification points. The first idea can only be credited for providing a clear celebration theme (Christmas) and an appropriate light source. Because LEDs have been used in idea 1, idea 2 can only gain credit for the Halloween theme.

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Examiner Tip

Use a '1 to 8' numbering system with your labels to make sure that you do not miss anything.

Question 13 (a)(i)

Most candidates were able to identify the component correctly but for the second mark they needed to provide a more technical point by e.g. referring to grip provided by the rubber or the pressure applied by the spring.

(a) Describe how the tuner is successful in meeting the following specification points:

(i) It is easy to fix to the guitar.

(2)

It has a rubber clamp so it can fix to the top of the guitar with ease

This is a relatively good response which references the rubber clamp and the grip it provides. 2 marks awarded.

ResultsPlus
Examiner Comments

It is important to refer to the properties of a material or component which make it suitable for its purpose.

ResultsPlus
Examiner Tip

Ask yourself which property of rubber made the designer choose that particular material.

(a) Describe how the tuner is successful in meeting the following specification points:

(i) It is easy to fix to the guitar.

(2)

It has a spring loaded part so it easily clamps down and also has a rubber clamp ~~that~~ which provides extra grip and prevents damaging the guitar.

ResultsPlus
Examiner Comments

This answer makes no attempt to explain why the clamp is easy to fix, in fact it simply repeats the words used in the question.

ResultsPlus
Examiner Tip

Read the question carefully to make sure that you do not simply repeat it in your answer.

Question 13 (a)(ii)

Once again the easier first mark only required the candidates to identify the correct component but for the second mark, the candidates were expected to provide a more technical point.

(ii) It is easy to see if the note being played is in tune.

(2)

The swivelling case makes it easy to see the note as the user can adjust/swivel the screen to have a clear view of it from their position

ResultsPlus
Examiner Comments

This response provides a good explanation. 2 marks awarded.

Question 13 (b)

Candidates were expected to provide a technical explanation and many were able to refer to the higher resolution of LCD displays and their lower power consumption.

(b) Explain **two** advantages of using a liquid crystal display (LCD) instead of an LED dot-matrix display for the tuner:

(4)

Advantage 1

The LCD is thinner which means casing can be slimmer and more compact which would make it more appealing to buy

Advantage 2

The LCD shows higher resolution images so more can be sit onto a LCD screen at higher quality so the user can see all the info they need clearly so the product is more apealing to buy

This answer explains two advantages successfully using technical terms.

ResultsPlus
Examiner Comments

By including the correct technical terms candidates can demonstrate good understanding. 4 marks awarded.

ResultsPlus
Examiner Tip

Use connective words such as 'so' and 'because' to expand your explanation.

(b) Explain **two** advantages of using a liquid crystal display (LCD) instead of an LED dot-matrix display for the tuner:

(4)

Advantage 1

easier to see

Advantage 2

costs less than an L.E.D dot matrix display

ResultsPlus
Examiner Comments

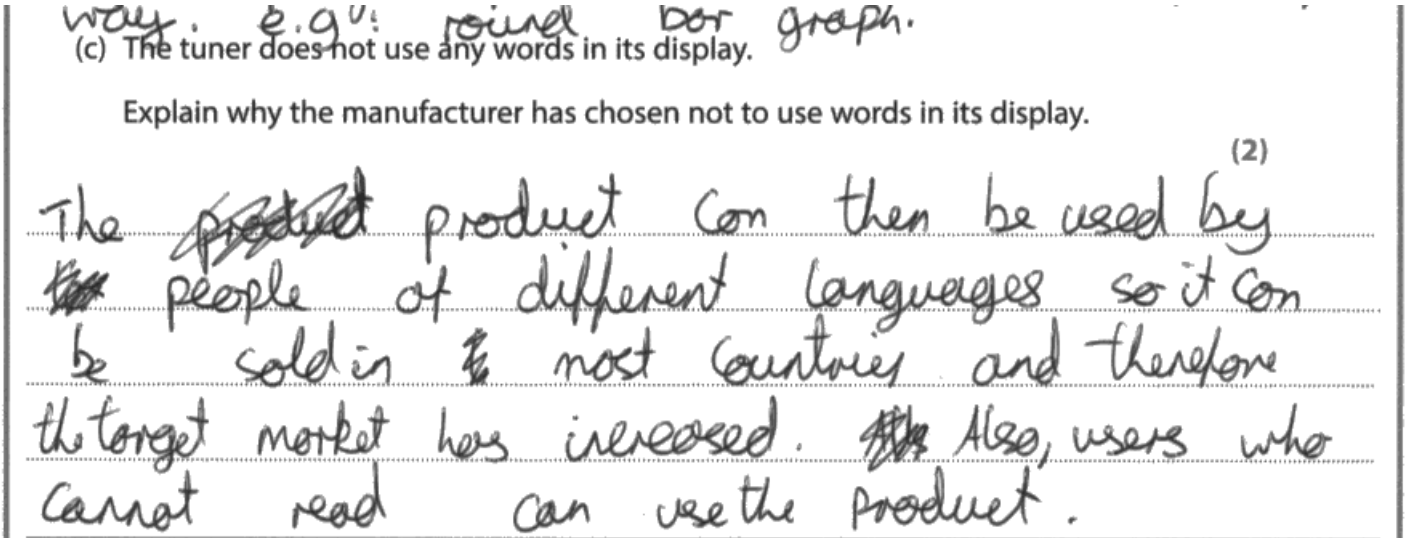
This response uses generic, unjustified points which fail to attract any credit.

ResultsPlus
Examiner Tip

Try to avoid general unjustified terms such as 'cheaper' or 'easier' and make sure that you explain your answers.

Question 13 (c)

This question helped to differentiate stronger candidates from weaker ones. Answers were expected to focus upon the demands of designing for a global market.


way. e.g. round dot graph.

(c) The tuner does not use any words in its display.

Explain why the manufacturer has chosen not to use words in its display.

(2)

The product can then be used by people of different languages so it can be sold in most countries and therefore the target market has increased. Also, users who cannot read can use the product.

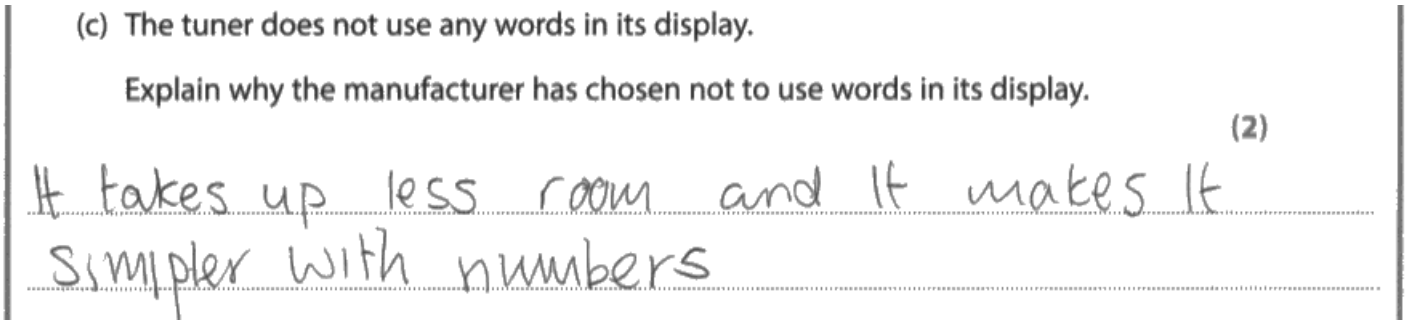
This answer explains how the manufacturer will be able to access the larger global market. 2 marks awarded.

ResultsPlus
Examiner Comments

Candidates should be encouraged to confine answers to the space provided.

ResultsPlus
Examiner Tip

Make sure you understand the focus of the question. Read it more than once.


(c) The tuner does not use any words in its display.

Explain why the manufacturer has chosen not to use words in its display.

(2)

It takes up less room and it makes it simpler with numbers

ResultsPlus
Examiner Comments

This answer focuses upon the user rather than the manufacturer. 0 marks awarded.

Question 13 (d)

This question triggered a range of responses. The level based marking scheme was applied. Stronger responses tended to:

- focus on 3 or 4 areas, expanding arguments in depth
- focus upon the 'performance requirements' of the two materials
- make a comparison between these
- relate arguments to the product.

Most candidates successfully identified a range of performance requirements relating to the two materials and made a comparison. Strong level 3 comparisons exhibited good subject knowledge and expanded relevant arguments to explain points more effectively. For example, when discussing the issues related to manufacturing, a strong response would go beyond the fact that HIPS could be injection moulded to explain how this would be suitable for forming the relatively complex shape of the case.

Many weaker, level 1 and 2 responses often concentrated upon generic properties and failed to expand their answers beyond their initial point. If points were expanded, it was often only at a superficial level. For example, a weaker response would simply list a range of manufacturing processes including vacuum forming and line bending which were irrelevant to the product in question.

Candidates who submitted grids or lists often failed to form effective expansions or comparisons. Many candidates tried to cover as many aspects as they could and this prevented them from discussing the issues in any depth. Higher scoring responses tended to focus on fewer areas and explored them in more detail, establishing links between related points. Issues of legibility were sometimes a concern and candidates should be reminded to communicate their ideas clearly and effectively. QWC was also assessed here.

*(d) The case of the tuner is made from high impact polystyrene (HIPS) but could have also been made from mild steel.

Compare the **two** materials for use in the case in terms of performance requirements.

(6)

The pros to using mild steel is it harder than HIPS, It's better aesteticaly than HIPS and it has a higher tensile Strength than HIPS. The cons are mild steel rusts, mild steel is more expensive than HIPS and mild steel is less malluble than heated HIPS.

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Examiner Comments

This is a good example of a weak level 1 response. Some valid properties are identified but the candidate fails to expand upon them and fails to push the comparison on to explore issues in more detail. This response is essentially a list of properties.

ResultsPlus
Examiner Tip

Use spare space on the paper to plan your answer. It is important to write clearly and neatly.

It is important to avoid writing a long list. You should try to expand upon your points using connective words and phrases. Once you have written a point add a connective.

*(d) The case of the tuner is made from high impact polystyrene (HIPS) but could have also been made from mild steel.

Compare the **two** materials for use in the case in terms of performance requirements.

*and when HIPS is formed through blow/injection moulding, it doesn't need a finish. (6)

HIPS is much easier to mould. It can be blow / injection moulded. This means that more complex shapes can be formed, therefore the company wouldn't have to make any comprimises to shape.*

However, steel is more durable, so is more likely to last longer then HIPS.

However, steel conducts electricity, whereas HIPS doesn't. If the circuit touched the steel, it could cause a short circuit, meaning the product wouldn't work at all.

Also, HIPS is ~~[illegible]~~ less dense (lighter per kg), so it would be easier to carry around than mild steel.

HIPS is also easier to colour, so can be modified more easily. ~~Looks better~~

However, HIPS has a lower softening point, so it would be easier for a HIPS case to change/lose its shape, which could damage the circuit

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Examiner Comments

This level 3 response demonstrates a good understanding of the subject. The candidate uses technical vocabulary and provides a real comparative analysis. Points are expanded effectively and conclusions are drawn. The arguments are related to the case and function of the tuner.

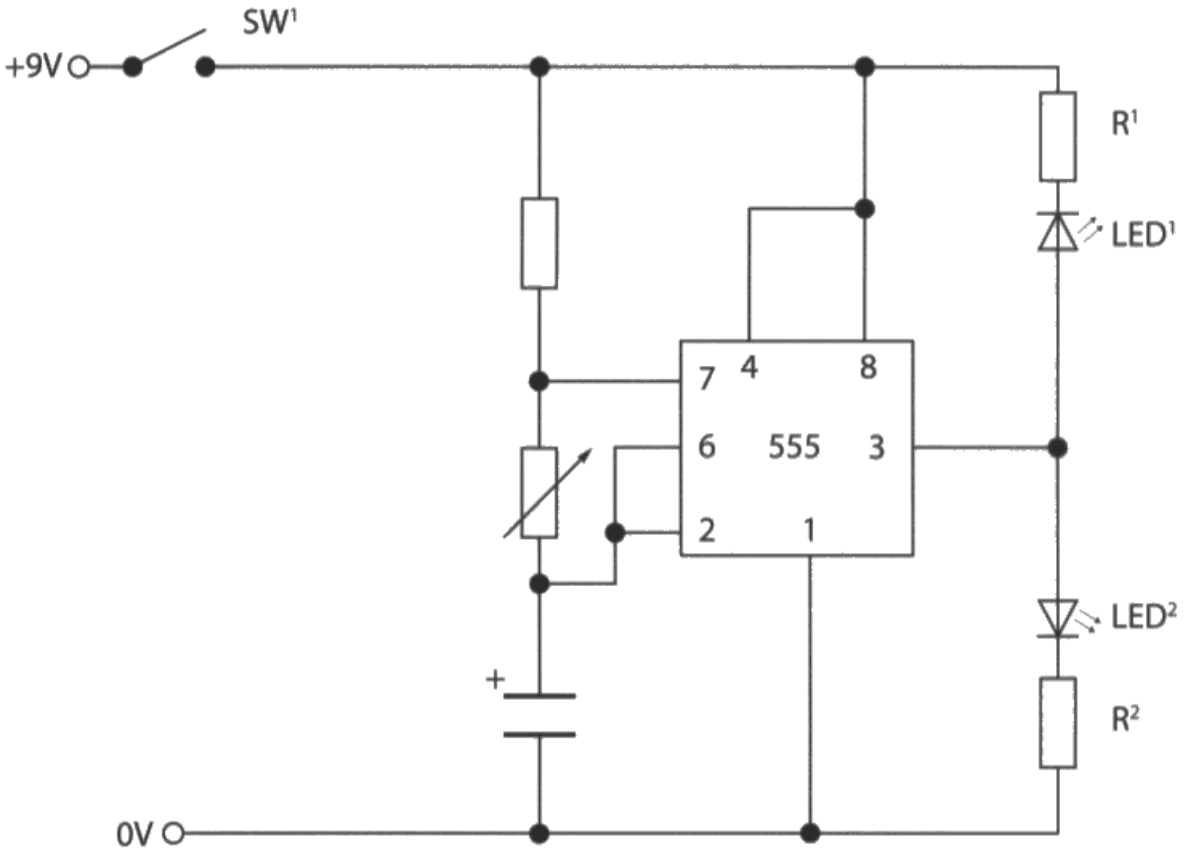
ResultsPlus
Examiner Tip

For questions like this it is important to focus upon the performance requirements of the materials, make a comparison and to relate arguments to the product.

Question 14 (a)

Most candidates were able to explain an aspect of the output of an astable circuit and a wide range of responses gained credit.

14 The astable circuit diagram below will be used for a Christmas decoration.



(a) Explain the term 'astable'.

(2)

There is no stable state so when activated there is current (when SW1 pressed) the 555 changes from sourcing to sinking repeatedly

ResultsPlus
Examiner Comments

This is an example of a good response which defines the term 'astable' and describes the output accurately. 2 marks awarded.

ResultsPlus
Examiner Tip

Make sure that you can explain commonly occurring circuits.

Question 14 (b)

Many candidates failed to spot the issue in this circuit; however, most provided an answer. Those who understood the problem often went on to provide a credit worthy explanation but sometimes failed to get the second mark.

(b) When SW[1] is closed, one of the LEDs does not light up.

(i) State which LED does not light up. **(1)**

LED1

(ii) Explain why this LED does not light up. **(2)**

because The LED is upside down

This response correctly identifies LED1 as the problem and gives the correct reason for its failure to work.

ResultsPlus
Examiner Comments

This candidate has missed the opportunity to expand upon the initial point to turn this answer into an explanation. 2 marks awarded.

ResultsPlus
Examiner Tip

Make sure you expand your answers for 'explain' questions to get the second mark.

Question 14 (c)

Although many candidates struggled with this question most were able to garner some marks. The ECF (Error Carries Forward) method was applied which credited each individual step and rewarded candidates when they performed a correct operation. It was therefore very important to show each stage clearly. However, the final mark for an accurate calculation was not available if candidates had failed to perform satisfactorily in another area.

(c) Resistors R^1 and R^2 have the same value.

Apply the formula V = I x R to calculate the correct value for R^1 and R^2 using the information given.

LED requires 2V at 10mA

You must show your working.

(4)

10 mA = 0.01 A

V = I × R R = V ÷ I

R = (V$_{in}$ − V$_f$) ÷ I

R = (9 − 2) ÷ 0.01 = 7 ÷ 0.01 = 700

The resistance is 700 Ω

R = 700 Ω

This is a very good example of a strong response. Each stage is recorded clearly and logically. 4 marks awarded.

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Examiner Comments

The most common mistake was to use the incorrect voltage.

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Examiner Tip

Practice recalling your formulae and doing calculations.

(c) Resistors R¹ and R² have the same value. be facing the other way.

Apply the formula V = I x R to calculate the correct value for R¹ and R² using the information given.

LED requires 2V at 10mA

You must show your working.

(4)

10mA = 0.01A

$R = \frac{V}{I}$

$R = \frac{2}{0.01}$

R = 200

R¹ and R² must be 200Ω or (200R)

ResultsPlus
Examiner Comments

This candidate rearranged the formula and converted milliamps to amps correctly so the mark for calculating the total was also available. Their only mistake was to use the incorrect voltage.

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Examiner Tip

If you show your working in clear stages like this example, you may get some marks even if you get the answer wrong.

Question 14 (d)

Most candidates understood that PICs could be programmed to perform a wider range of functions but often it was only the stronger candidates who were able to apply the comparison to the 555 timer and to the decoration. A common mistake was to describe the PIC as smaller (than the 555 timer).

(d) The Christmas decoration could be controlled by using a peripheral interface controller (PIC).

Explain **two** advantages of using a PIC to control the Christmas decoration.

(4)

Advantage 1

The pic can be reprogrammed to different things such as changing the flash of the LED. this means if the user wants a different working decoration they can change the pic rather than wasting money for a new product.

Advantage 2

The pic takes the place of lots of components, so the size of the circuit can be reduced and therefore reducing the size of the overall product if it is too big. This mean less space is taken up when storing it.

This answer correctly explains that the PIC can be programmed to alter the output pattern. It goes on to explain that the size of the PCB and circuit could be reduced as the number of components could be reduced. 4 marks awarded.

ResultsPlus
Examiner Comments

This response successfully draws upon information provided earlier.

ResultsPlus
Examiner Tip

Try to explain your answers in detail.

(d) The Christmas decoration could be controlled by using a peripheral interface controller (PIC).

Explain **two** advantages of using a PIC to control the Christmas decoration.

(4)

Advantage 1

the pic chip is small so it wont take much space up in the casing

Advantage 2

it can be programed to do different things - its easy to change the time when the LED's flash etc.

ResultsPlus
Examiner Comments

As a PIC and 555 timer IC could be identical in size the first advantage is incorrect. 2 marks awarded.

ResultsPlus
Examiner Tip

Remember, many different components come in identical packages.

Question 14 (e)

This question required candidates to read the question carefully. It was important for candidates to focus upon the 'user' and many candidates failed to recognise this. It was also important for candidates to address both advantages and disadvantages and almost all candidates went on to do so. The level based marking scheme was applied and QWC was taken into consideration for this question.

Weaker responses tended to offer lists of advantages and disadvantages with little or no expansion. The candidates tended to go from one point to the next and if there was an expansion of the argument it was often superficial. Again candidates who submitted grids or bullet lists sometimes failed to satisfy the criteria for a level 1 response. When candidates defaulted to an argument about wider environmental issues and failed to relate these to the feelings and opinions of the customer, for example, it was difficult to award any credit. Other weaker responses missed the point of the question entirely and focused upon disposable batteries.

Stronger responses were characterised by a focus upon the user, a good grasp of the arguments and the ability of candidates to expand upon them, exploring relevant issues in depth. It is sufficient to limit the discussion to 3 or 4 areas.

*(e) Electronic products are often thrown away when they break or the battery is flat.

Discuss the advantages and disadvantages of disposable electronic products to the user. NOT ~~MANUFACTURER~~

(6)

The advantages are that the user gets a the latest product with the newest feature every time the products ~~dies the dust~~ fails. It also means the user will be more sure they get a working product as it has ~~just~~ been recently made and hasn't been used yet. The disadvantages are that the user has to spend more money on products as they have to replace the whole product rather than just being able to replace just the damaged component. It also means the user's environmental impact will be increased,

because the unusable products will ~~have~~ to be thrown away ~~into~~ and most likely not recycled so will sit in a landfill for a long time. It also annoys the user as they have to constatly buy new products and this could decrease their view of the manufacturer.

This is an example of a weak level 3 response. This candidate clearly understands the arguments and expresses them articulately. This is a discussion rather than a list, and points are expanded effectively. Technical issues are addressed and there are few grammatical errors. When environmental issues are discussed they are related to the feelings of the user.

ResultsPlus
Examiner Comments

This question is designed to reward stronger candidates.

ResultsPlus
Examiner Tip

It is important to explain your points. Use connective words and phrases such as 'so that', 'therefore' and 'as a result'.

*(e) Electronic products are often thrown away when they break or the battery is flat.

Discuss the advantages and disadvantages of disposable electronic products to the user.

(6)

Disposable Electronic products are an advantage to us because they help to protect the environment from CO_2 emmisions. This would be useful to match the kyoto agreement. However, these disposable electronic products aren't always good because the transpot to make them disposable, and the processing, releases more CO_2 than constantly producing non-disposable ~~batteries~~ electronic products, this suggests that even though disposable products are more sustainable/environmentally friendly, the creation of them may outway the benefits.

This response is really exploring the effects of disposal upon society rather than the user. It fails to answer the question and would not attract any credit.

ResultsPlus
Examiner Comments

Although summary tables are provided as an aide memoire within the Marking Scheme, it is not an appropriate format to employ in response to the QWC questions.

ResultsPlus
Examiner Tip

Make sure you understand the focus of the question. Read everything carefully and highlight the keywords.

Paper Summary

Based on their performance on this paper, candidates are offered the following advice:

- It is usually advisable to avoid using general terms such as 'strong', 'cheap', 'fast', 'easy', and 'professional'. If you must use these terms it may help to add a justification and/or comparison e.g. 'cheaper than … because …'.
- Communication skills are important. Written responses should be neat and legible; annotated diagrams/sketches need to be clear and easy to understand.
- It is important to confine your answers to the spaces provided. If more space is needed additional sheets can be used but it is important to identify this within the booklet and on the additional sheet.
- Read the questions carefully. Repeating information from the question is unlikely to get you marks.
- Use the mark totals and answer spaces as a guide to the length of your answers.
- Be careful not to confuse similar components, e.g. transistors, FETs and thyristors.
- Try to remember that for two marks you will need a two-part response. Use connectives, such as 'so that' or 'because'.
- In question 12 it is often helpful to include supplementary sketches to explain your ideas. You need to refer to specific components e.g. 'rocker switch for on/off' rather than 'on/off switch'. Again, in question 12, be careful not to use the same components for both ideas e.g. 'red LED' and 'flashing LED' are both LEDs.
- Long answer questions should not be answered with lists or tables. It is better to focus upon 3 or 4 areas of discussion and to explore those in more depth. Make sure you understand the focus of the question. When a product is involved in a 'compare' question you should focus your points upon that product and make a comparison within each of your 3 or 4 arguments. If you are asked to focus upon a group such as the 'user' or for example 'performance requirements', you should relate all of your arguments to these areas.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

http://www.edexcel.com/iwantto/Pages/grade-boundaries.aspx

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