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# **GCE AS MARKING SCHEME**

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**SUMMER 2024**

**AS  
DESIGN AND TECHNOLOGY - FASHION & TEXTILES  
2602U10-1**

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## About this marking scheme

The purpose of this marking scheme is to provide teachers, learners, and other interested parties, with an understanding of the assessment criteria used to assess this specific assessment.

This marking scheme reflects the criteria by which this assessment was marked in a live series and was finalised following detailed discussion at an examiners' conference. A team of qualified examiners were trained specifically in the application of this marking scheme. The aim of the conference was to ensure that the marking scheme was interpreted and applied in the same way by all examiners. It may not be possible, or appropriate, to capture every variation that a candidate may present in their responses within this marking scheme. However, during the training conference, examiners were guided in using their professional judgement to credit alternative valid responses as instructed by the document, and through reviewing exemplar responses.

Without the benefit of participation in the examiners' conference, teachers, learners and other users, may have different views on certain matters of detail or interpretation. Therefore, it is strongly recommended that this marking scheme is used alongside other guidance, such as published exemplar materials or Guidance for Teaching. This marking scheme is final and will not be changed, unless in the event that a clear error is identified, as it reflects the criteria used to assess candidate responses during the live series.

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**GCE AS DESIGN AND TECHNOLOGY**

**SUMMER 2024 MARK SCHEME**

**UNIT 1 - FASHION AND TEXTILES**

<b>Question 1</b>				
<p>The bags shown below have been made by school students using equipment commonly found in a textiles classroom. The teacher has a responsibility to ensure the safety of students when using hazardous substances and equipment. Some of the items of equipment used to make the bags are listed below:</p> <ul style="list-style-type: none"> <li>• Batik pot</li> <li>• Sewing machine</li> <li>• Steam iron</li> <li>• Rotary cutter</li> </ul>		<b>AO3</b>	<b>AO4</b>	<b>Mark</b>
(a)	<p>Choose one item from the list above and explain the potential risks it may pose to the user.</p>		✓	2
<p><i>Answers that indicate an understanding of the risks and hazards associated with the equipment should be awarded up to 2 marks based on:</i></p> <ul style="list-style-type: none"> <li>• <b>Batik Pot</b> – risk of blisters and burns due to the pot and wax becoming extremely hot, risk of fire if left to overheat. Wax smoke is damaging to lungs so should not be breathed in. Risk of electrocution from plug or damaged electrical cord. Electrical cord could pose a trip hazard.</li> <li>• <b>Sewing machine</b> – risk of cut or stabbing with needle, risk of damage to eyes if needle snaps or is not fitted correctly. Risk of electrocution from plug or damaged electrical cord. Electrical cord could pose a trip hazard.</li> <li>• <b>Steam Iron</b> – risk of blisters, burns and scald from hot iron and steam. Risk of fire if iron is left to overheat. Risk of inhalation of fumes if iron is used on plastics or other synthetic fibres. Risk of electrocution from plug or damaged electrical cord. Electrical cord could pose a trip hazard.</li> <li>• <b>Rotary cutter</b> – risk of cutting or slicing, amputation of fingers if blade is not fitted correctly or cutting mat on a stable surface is not used. User should cut away from the body and close the safety cover when not in use. It should be stored safely and the blade should always be kept sharp.</li> </ul> <p><b>Guidance to markers</b></p> <p><i>Incorrect / no answer</i> <span style="float:right"><b>0</b></span></p> <p><i>Brief description of a risk with little or no detail of how an accident may occur:</i> <span style="float:right"><b>1</b></span></p> <p>The batik pot gets hot so could cause a burn or catch on fire.</p> <p><i>A more detailed description of a risk with a clear example of how an accident may occur for example:</i> <span style="float:right"><b>2</b></span></p> <p>The batik pot and wax gets hot so the user could burn themselves if they touch the pot or spill wax on themselves.</p> <p>Do not award any marks for a list of health and safety points.</p>				

(b)	Teachers would carry out a five-step risk assessment when planning for practical tasks. Discuss what a teacher would need to include in their five-step risk assessment in order to maintain the safety of students.		✓	6
<i>Answers that indicate an understanding of a five step risk assessment in relation to practical tasks should be awarded up to 6 marks based on:</i>				
<ul style="list-style-type: none"> <li>• The teacher would need to <u>identify the hazards</u> in the classroom. They should carry out a tour of the room and look for any potential hazard and use the manufacturer’s instructions for all equipment.</li> <li>• The teacher should identify <u>who is most at risk</u>, who might be harmed and what the nature of the harm might be. They should consider if some groups of pupils may be at greater risk of injury than others.</li> <li>• The teacher must <u>evaluate the risks</u> and decide on <u>control measures</u>. They must follow best practice and seek advice or follow the school guidelines. If the risk cannot be eliminated then the teacher must put control measures in place such as training for staff and pupils, PPE such as goggles, gloves, and aprons must be provided and equipment should be placed within clearly marked safety areas.</li> <li>• The teacher must <u>record their findings and implement actions</u> by writing down the results of their risk assessments and make them clear and concise for staff and pupils to read.</li> <li>• Teachers must <u>review and update</u> their risk assessment of the classroom every year. If new equipment is added, or the layout of the classroom changes or new skills/techniques are added to a project, then a new risk assessment should be done as soon as the changes have been introduced.</li> </ul>				
<b>Guidance to markers</b>				
<b>Note:</b> If candidate simply lists the five steps involved in a risk assessment then a maximum of 2 marks should be awarded.				
Incorrect / no answer				
Brief description with little detail in the response of what is involved in a five step risk assessment. Basic level of understanding or the candidate may have listed some or all of the steps.				0 1 - 2
Basic description with some detail in the response: some knowledge of what is involved in a five step risk assessment. Some evidence of knowledge and understanding.				3 - 4
More detailed description, with clear evidence of knowledge and understanding in the response: knowledge of each stage of the five step risk assessment with clear understanding of how it can be applied in a classroom setting. Almost all steps discussed in some detail.				5 - 6
<b>Total</b>				<b>8</b>

**Question 2**

Adaptive clothing collections are becoming increasingly available in high street shops. They include garments like the ones shown below that have been designed for people with physical disabilities.		AO3	AO4	Mark
(a)	Analyse the importance of user-centred design in order to meet the needs and wants of customers who have physical disabilities.	✓		8
<p><i>Answers that indicate an understanding of how user centred design is used to design and manufacture clothes for customers specific needs and wants should be awarded up to 8 marks based on:</i></p> <ul style="list-style-type: none"> <li>• <i>User –centred design (UCD) is focused around the needs of the end user who in this case is a person with a physical disability.</i></li> <li>• <i>UCD would allow the designer to identify the issues such as ease of dressing and undressing, comfort, ease of access when using a toilet.</i></li> <li>• <i>Designers involve users at all stages of the design process via research and design techniques to create highly useable and accessible products.</i></li> <li>• <i>Designers try to develop an understanding of what the customer needs and use iterative design to develop a product that meets the needs of the customer.</i></li> <li>• <i>Through the use of UCD, designers can identify problems that they may not have been aware of, and therefore establish gaps in the market for products that provide a solution to those problems encountered by people with physical disabilities.</i></li> <li>• <i>UCD involves the use of tests so that prototypes can be tested by actual users during each stage of the design process.</i></li> <li>• <i>All developments of the product are done as a direct result of feedback from the end user.</i></li> <li>• <i>UCD leads to increased product usefulness and usability.</i></li> <li>• <i>UCD focuses on how users want or need to use the product rather than forcing the user to change their behaviour in order to accommodate the product. This is essential when designing for people with physical disabilities,</i></li> <li>• <i>User-centred evaluation allows designers to then find out the real opinions of target customers in order to influence future designs and developments.</i></li> </ul>				

<b>Guidance to markers</b>		
<ul style="list-style-type: none"> <li>• Incorrect/no answer</li> </ul>	<b>0</b>	
<ul style="list-style-type: none"> <li>• Candidate has a simplistic knowledge.</li> <li>• The use of terminology and technical language is basic.</li> <li>• Brief description of the main features of user-centred design; little understanding evident; basic or no examples given of how it impacts the design of garments for people with physical disabilities.</li> </ul>	<b>1 - 2</b>	
<ul style="list-style-type: none"> <li>• Candidate has some basic understanding of the issues associated with user-centred design.</li> <li>• The use of terminology and technical language is variable.</li> <li>• Some understanding of how it impacts the design of garments for people with physical disabilities evident in explanation.</li> </ul>	<b>3 - 4</b>	
<ul style="list-style-type: none"> <li>• The candidate has clear understanding of the issues associated with user-centred design.</li> <li>• The use of terminology and technical language is mostly accurate.</li> <li>• More detailed description of the impact user-centred design has on garments for people with physical disabilities with more detailed knowledge and understanding evident; appropriate examples included.</li> </ul>	<b>5 - 6</b>	
<ul style="list-style-type: none"> <li>• The candidate demonstrates very clear understanding of the issues associated with user-centred design.</li> <li>• Uses correct terminology and technical language.</li> <li>• Full and detailed description and understanding of how user-centred design benefits the end user and designer at each stage. Full and detailed explanation with highly relevant exemplars included.</li> </ul>	<b>7 - 8</b>	
<b>Total</b>		<b>8</b>

**Question 3**

Zips are a simple way to fasten two edges together. They can be both functional and decorative.		AO3	AO4	Mark
(a)	Name <b>two</b> types of zip and explain why they are suitable for use in a specific textiles product.		✓	6
<p><i>Answers that indicate an understanding of what makes different types of zips suitable for specific textiles products should be awarded up to 3 marks based on:</i></p> <ul style="list-style-type: none"> <li>• Metal zips are durable and ideal for heavyweight products such as bags, coats and leather.</li> <li>• Plastic zips are cheap and cost effective, fairly flexible, used for pencil cases, lightweight bags and clothing.</li> <li>• Coil zips are lightweight but strong, very flexible, zip teeth are subtle making it ideal for products where the zip is not meant to stand out such as skirts, suits, lightweight knits and boots.</li> <li>• Invisible/concealed zips are lightweight and flexible. Teeth are on the reverse side of the zip so cannot be seen in items such as skirts, trousers, dresses.</li> <li>• Open ended/separating zips separate at the top and bottom, ideal for products such as hoodies, gilets and coats.</li> <li>• Closed zips have a bar across the bottom that keeps the zip in one piece, ideal for bags and garments such as skirts and trousers.</li> <li>• Double sided/two way zips can be open and closed from two opposite ends at the same time.</li> </ul> <p><b>Guidance to markers</b></p> <p><b>Note:</b> Award one mark for a correctly named zip and up to two marks for a correct explanation of why the named zip is suitable for a specific textiles product. Maximum of 1 mark for the explanation if no product is named.</p> <p><i>Incorrect / no answer</i> <span style="float: right;"><b>0</b></span></p> <p><i>Brief description, very little detail for example:</i> Metal zip. <span style="float: right;"><b>1</b></span></p> <p><i>Some detail with some understanding for example:</i> Metal zip A metal zip has metal teeth so it is strong and durable. <span style="float: right;"><b>2</b></span></p> <p><i>A more detailed level of understanding for example:</i> Metal zip A metal zip has metal teeth so it is strong and durable which make it ideal for products that are made from heavier fabrics such as luggage bags. <span style="float: right;"><b>3</b></span></p>				

(b)	Explain <b>one</b> advantage to the manufacturer of using bought-in components such as a zip when making textile products.		✓	2
<i>Answers that indicate an understanding of the advantages to manufacturers of using bought in components should be awarded up to 2 marks based on:</i>				
<ul style="list-style-type: none"> <li>• There is a wide range of colours, sizes and styles to choose from.</li> <li>• Components can be bought in bulk which reduces the cost per unit.</li> <li>• The garment manufacturer does not need to invest in specialist machinery to make components.</li> <li>• Readily available and so this could reduce storage costs as can be ordered when needed if using JIT stock-control system.</li> <li>• Manufacturing machinery can be pre-set to standard component sizes making the process more efficient.</li> </ul>				
<b>Guidance to markers</b>				
<i>Incorrect / no answer</i>				
<i>Brief description, with some understanding for example:</i>				
Bought in components are cheaper to buy than if the manufacturer was to try and make them.				
<i>Some detail with some understanding of how using bought in components benefits the manufacturer for example:</i>				
Bought in components are cheaper to buy in rather than if the manufacturer were to try and a make them as there would be additional set costs of equipment and machinery.				
				0
				1
				2

**Question 4**

The toiletry bag shown below is made from 100% polyester.		AO3	AO4	Mark
(a)	Describe the specific properties of polyester that make it suitable for the toiletry bag.		✓	2
<p><i>Answers that indicate an understanding of the relevant properties of polyester should be awarded up to 2 marks based on:</i></p> <ul style="list-style-type: none"> <li>• Absorbs low levels of moisture</li> <li>• Dries quickly / easy to wash</li> <li>• Strong and durable, excellent abrasion resistance.</li> <li>• Good crease resistance</li> <li>• Mould and mildew resistant</li> <li>• Dyes well</li> <li>• Can be soft and lightweight</li> <li>• Resistant to stretching and shrinking</li> </ul> <p><b>Guidance to markers</b></p> <p><b>Note:</b> award 2 marks if the candidate has only identified one property but has provided a detailed explanation as to how that property is relevant to the toiletry bag.</p> <p><i>Incorrect / no answer</i></p> <p><i>Brief description of a property of polyester for example:</i> Polyester dries quickly if it has to be washed or gets wet.</p> <p><i>Two properties identified or a more detailed explanation for example:</i> Polyester is resistant to mildew which make it a good choice for the toiletry bag as it may be stored in a bathroom where there are high levels of moisture.</p>				0
				1
				2

(b)	Explain why the drawstring method of opening and closing the toiletry bag is a practical solution for this type of product.		✓	2
<p><i>Answers that indicate an understanding of how the methods of opening and closing benefit the function of the toiletry bag should be awarded up to 2 marks based on:</i></p>				
<ul style="list-style-type: none"> <li>• <i>The drawstring closure keeps the bag closed securely and prevents smaller items from falling out.</i></li> <li>• <i>The drawstring feature allows the bag to be fully opened and laid out flat so all toiletries are visible and easy to find.</i></li> <li>• <i>The toggle means it secures the drawstring without the need to tie a bow or knot.</i></li> </ul>				
<p><b>Guidance to markers</b></p>				
<p><i>Incorrect / no answer</i></p>				
<p><i>Brief description with some understanding of how specific features of the bag work for example:</i></p>				
<p>The drawstring can be fully closed or opened to make the bag bigger or smaller.</p>				
<p><i>A more detailed description, with clear understanding of how specific features of the bag work with reference to the function of the bag for example:</i></p>				
<p>The drawstring can be fully opened which means that the bag can be laid out flat in order to easily see and access the products inside.</p>				
				<b>0</b>
				<b>1</b>
				<b>2</b>

(c)	Use notes and sketches to explain how you would construct the drawstring feature on the toiletry bag shown above.		✓	4										
<p><i>Answers that indicate an understanding of how to create a casing and insert a drawstring should be awarded up to 4 marks based on:</i></p>														
<ul style="list-style-type: none"> <li>• <i>Create openings for the drawstring to enter or exit through by cutting a 2 inch line from the edge towards the centre.</i></li> <li>• <i>As the shape is curved it may help to snip the edge of the material at intervals for ease.</i></li> <li>• <i>Create the casing by folding over the material edge and folding again, similar to a hem.</i></li> <li>• <i>Sew along the edge to create a channel that the drawstring can pass through.</i></li> <li>• <i>Thread the drawstring through the casing and pull to tighten.</i></li> </ul>														
<p><b>Guidance to markers</b></p>														
<p><b>Note:</b> <i>Accept all other correct methods such as use of bias binding to create a separate casing, the use of a facing or eyelets provided the candidate has correctly described the method.</i></p>														
<table border="1"> <tr> <td> <ul style="list-style-type: none"> <li>• Incorrect/no answer</li> </ul> </td> <td style="text-align: center;"><b>0</b></td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• Candidate has a simplistic knowledge.</li> <li>• The use of terminology and technical language is basic.</li> <li>• Simple diagram, very little detail or explanation.</li> </ul> </td> <td style="text-align: center;"><b>1</b></td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• Candidate has some basic understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is variable.</li> <li>• Some detail in diagram(s) with some understanding of the steps involved in the process.</li> </ul> </td> <td style="text-align: center;"><b>2</b></td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• The candidate has a good understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is reasonably accurate.</li> <li>• More detailed level of understanding shown in the diagram(s) with good understanding of the steps involved in the process.</li> </ul> </td> <td style="text-align: center;"><b>3</b></td> </tr> <tr> <td> <ul style="list-style-type: none"> <li>• The candidate demonstrates a clear understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is mostly accurate.</li> <li>• Detailed explanation and understanding evident in diagrams with clear knowledge of the steps involved in the process.</li> </ul> </td> <td style="text-align: center;"><b>4</b></td> </tr> </table>					<ul style="list-style-type: none"> <li>• Incorrect/no answer</li> </ul>	<b>0</b>	<ul style="list-style-type: none"> <li>• Candidate has a simplistic knowledge.</li> <li>• The use of terminology and technical language is basic.</li> <li>• Simple diagram, very little detail or explanation.</li> </ul>	<b>1</b>	<ul style="list-style-type: none"> <li>• Candidate has some basic understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is variable.</li> <li>• Some detail in diagram(s) with some understanding of the steps involved in the process.</li> </ul>	<b>2</b>	<ul style="list-style-type: none"> <li>• The candidate has a good understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is reasonably accurate.</li> <li>• More detailed level of understanding shown in the diagram(s) with good understanding of the steps involved in the process.</li> </ul>	<b>3</b>	<ul style="list-style-type: none"> <li>• The candidate demonstrates a clear understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is mostly accurate.</li> <li>• Detailed explanation and understanding evident in diagrams with clear knowledge of the steps involved in the process.</li> </ul>	<b>4</b>
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<ul style="list-style-type: none"> <li>• The candidate demonstrates a clear understanding of the issues associated with the question.</li> <li>• The use of terminology and technical language is mostly accurate.</li> <li>• Detailed explanation and understanding evident in diagrams with clear knowledge of the steps involved in the process.</li> </ul>	<b>4</b>													
<b>Total</b>				<b>8</b>										

**Question 5**

The pyjama top shown below is made from cotton jersey and the letters have been cut out using a laser cutter.		AO3	AO4	Mark
(a)	The pyjama top features letters and a decorative motif. Explain how the material choice of cotton jersey may compromise the durability of these decorative features over time.		✓	2
<p><i>Answers that indicate an understanding of how the characteristics of cotton jersey may negatively affect the appearance, quality and durability of the design should be awarded up to 2 marks based on:</i></p> <ul style="list-style-type: none"> <li>• The stretchy nature of the fabric could mean the motif or text will lose their shape over time</li> <li>• The raw edges can unravel or roll and spoil the look of the design</li> <li>• Jersey is prone to shrinkage and this could alter the appearance of the text and motif.</li> </ul> <p><b>Guidance to markers</b></p> <p><i>Incorrect / no answer</i></p> <p><i>Brief explanation, some understanding for example:</i> Jersey is stretchy so the horse or letters may lose their shape.</p> <p><i>Detailed explanation, with clear understanding for example:</i> Jersey is stretchy and prone to unravelling and so over time the lettering and motif could start to deteriorate especially once it has been washed many times.</p>				0
				1
				2

(b)	Cotton Jersey is a knitted fabric. Explain <b>two</b> steps that you would take to ensure a high-quality finish when laser cutting cotton jersey.		✓	4
<p><i>Answers that indicate an understanding of how the characteristics of cotton jersey affect the way in which it should be laser cut should be awarded up to 2 marks per step based on:</i></p> <ul style="list-style-type: none"> <li>• <i>Iron the fabric prior to laser cutting to get rid of any wrinkles.</i></li> <li>• <i>Iron on interfacing or bonda web before laser cutting.</i></li> <li>• <i>Smooth out the fabric so it lays flat on the laser bed but avoid stretching it or the design will be stretched.</i></li> <li>• <i>Use the selvedge to line up the grainline to the laser bed.</i></li> <li>• <i>Run a series of test cuts to establish the best power and speed settings.</i></li> <li>• <i>Weigh the fabric down to prevent the fan from, blowing the fabric out of place.</i></li> </ul> <p><b>Guidance to markers</b></p> <p><i>Incorrect / no answer</i></p> <p><i>Brief description, some understanding for example:</i> Make sure the fabric is flat on the laser bed so it can be cut accurately.</p> <p><i>A more detailed explanation with clear understanding of how to achieve a high quality finish when laser cutting cotton jersey for example:</i> Make sure the fabric is laid flat on the laser bed with no wrinkles but avoid overstretching the fabric as the designs will be stretched out of shape once cut.</p>				<p><b>0</b></p> <p><b>1</b></p> <p><b>2</b></p>
(c)	Describe an alternative stitched method of applying the letters to the pyjama top that would maintain the aesthetic appeal of the product over time.		✓	2
<p><i>Answers that indicate an understanding of the methods that could be used to add strength and durability to the design should be awarded up to 2 marks based on:</i></p> <ul style="list-style-type: none"> <li>• <i>Use of a strong polyester thread in order to maximise the stitch line strength.</i></li> <li>• <i>Use of a satin stitch that fully conceals the raw edge of the fabric.</i></li> <li>• <i>Use of digital embroidery machine to create applique letters.</i></li> <li>• <i>Accept zigzag stitch provided the stitch length and width has been clarified.</i></li> <li>• <i>Reference to machine applique stitch (blanket stitch).</i></li> </ul> <p><b>Guidance to markers</b></p> <p><b>Note:</b> <i>answers must relate to strength and durability, not appearance.</i></p> <p><i>Incorrect / no answer</i></p> <p><i>Brief explanation, some understanding for example:</i> Use a satin stitch</p> <p><i>Detailed explanation, with clear understanding for example:</i> Use a satin stitch to fully conceal the raw edge of the fabric which would prevent it fraying in the future.</p>				<p><b>0</b></p> <p><b>1</b></p> <p><b>2</b></p>
<b>Total</b>				<b>8</b>

**Question 6**

The image below shows a basic e-textiles circuit with a Light Emitting Diode (LED).	AO3	AO4	Mark
(a) Describe the function of the components used that allow the LED to be turned on and off.		✓	4
<p><i>Answers that indicate an understanding of how the LED is powered by the components of the circuit board should be awarded up to 4 marks based on:</i></p> <ul style="list-style-type: none"> <li>• The LED is powered by a coin cell battery</li> <li>• The circuit is sewn using conductive thread</li> <li>• The negative side of the battery is connected via thread to the negative (shorter) leg of the LED</li> <li>• The positive side of the battery is connected to the switch which is made from a metal press stud.</li> <li>• The thread continues from the second press stud and is connected to the positive (longer) leg of the LED</li> <li>• When the press stud is closed this acts as a switch to complete the circuit allowing charge to flow to the LED and light up.</li> </ul> <p><b>Guidance to markers</b></p> <p><i>Incorrect/no answer</i></p> <p><i>Brief description, very little understanding for example:</i> When the popper is closed, the LED will turn on and when the popper is opened it will switch off,</p> <p><i>Some detail with some understanding of how the circuit operates for example:</i> The LED is powered by a battery that lights up the LED when the switch is closed. The switch is a metal popper, so it conducts electricity.</p> <p><i>A more detailed explanation with clear understanding of how an e-textiles circuit operates for example:</i> The circuit is sewn using conductive thread which carries the current from the battery. The LED is connected to the battery via the conductive thread and a metal press stud which opens and closes the circuit to turn the LED on and off.</p> <p><i>Fully detailed explanation with clear understanding of how an e-textiles circuit operates for example:</i> The circuit is sewn using conductive thread which carries the current from the battery. The positive and negative threads are connected to the LED however the positive thread is connected to a metal press stud that acts as a switch to turn the LED on and off when it is opened and closed as this breaks or completes the circuit.</p>			
			0
			1
			2
			3
			4

(b)	Describe the checks you would make if the LED did not light up once you had completed the sewing of your e-textiles circuit and activated the switch.		✓	4
<i>Answers that indicate an understanding of the faults that might cause a circuit not to work should be awarded up to 4 marks based on:</i>				
<ul style="list-style-type: none"> <li>• LED orientation – the positive leg of the LED must be connected to the positive side of the battery and negative leg to the negative side of the battery.</li> <li>• Short circuit – check that the positive and negative threads do not overlap or touch at any point.</li> <li>• Loose connections – check that the threads are tightly sewn to the leg of the LED so that a secure connection is made. Ensure that the thread also makes a secure contact with the metal plate of the battery cell holder and switch. No breaks in the sewn thread.</li> <li>• Battery insertion – ensure that the battery is fully charged and working and that it is inserted correctly so that the positive and negative identifiers match.</li> </ul>				
<b>Guidance to markers</b>				
<i>Incorrect/no answer</i>				
<b>0</b>				
<i>Brief description, very little understanding for example:</i>				
I would check that the battery works and is the right way around.				
<b>1</b>				
<i>Some detail with some understanding of the faults that could occur within the circuit for example:</i>				
I would check that the battery is properly inserted and that there are no loose connections				
<b>2</b>				
<i>A more detailed explanation with clear understanding of the faults that could occur within the circuit for example:</i>				
I would check that the battery is connected so that the positive and negative symbols match and that the threads have been sewn to the correct legs of the LED.				
<b>3</b>				
<i>Fully detailed explanation with clear understanding of the faults that could occur within the circuit for example:</i>				
I would check that the positive leg of the LED is connected to the positive side of the battery and that the negative leg is connected to the negative side of the battery as it will not work if it is the wrong way around. I would also check that there is no overlapping of the positive and negative threads as this would create a short circuit.				
<b>4</b>				

(c)	<p>The life jackets and cycling jacket shown below are made from technical fabrics. They use reflective technology and e-textiles to enhance the visibility of products designed to keep the user safe.</p> <p>Evaluate the advantages and disadvantages of reflective technology and e-textiles in the manufacture of textiles products designed to keep us safe.</p>	✓		8
<p><i>Answers that indicate an understanding of the advantages and disadvantages of reflective fabrics and e-textiles in relation to safety products should be awarded up to 8 marks based on:</i></p> <p><i>Reflective fabrics:</i></p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• <i>help the wearer be more visible in the dark when a light source is present such as car head lights.</i></li> <li>• <i>can be used on safety garments such as cycling wear, outdoor sports wear, life jackets, headwear, swimwear and bags.</i></li> <li>• <i>almost any fabric can be made reflective by coating it with tiny glass beads that reflect light back to its original source.</i></li> <li>• <i>generally water and wind resistant and will add strength to the base material.</i></li> <li>• <i>easy to sew, can be self-adhesive and durable</i></li> <li>• <i>lightweight so will not weigh the user down.</i></li> <li>• <i>reflective coatings can be applied in patterns to enhance aesthetics.</i></li> <li>• <i>a range of aesthetic choices available to enhance the garment or product such as rainbow, iridescent or neon reflective fabric.</i></li> </ul> <p><i>Disadvantages</i></p> <ul style="list-style-type: none"> <li>• <i>it is not a breathable fabric but can be made so by perforating the fabric to allow for better ventilation and preventing the wearer from overheating.</i></li> <li>• <i>reflective fabric only becomes visible when a light source shines onto it.</i></li> <li>• <i>the reflective fabric is only visible to the person in line with the light source</i></li> <li>• <i>reflective material would only work in dark conditions when lights are directed at them and not in poor or overcast lighting when car headlights may not be used.</i></li> <li>• <i>reflective fabric can only addresses visibility issues in safety garments</i></li> </ul> <p><i>E-textiles</i></p> <p><i>Advantages</i></p> <ul style="list-style-type: none"> <li>• <i>E –textiles can be used in safety garments to improve not only visibility but can also help to keep people safe by making noise, tracking GPS locations, providing easy ways to pay for goods/transport without cash, monitoring health statistics.</i></li> <li>• <i>they are flexible and there are no wires so comfortable to wear</i></li> <li>• <i>can be applied to almost all materials</i></li> <li>• <i>can cover a large surface area of fabric or a garment</i></li> <li>• <i>can be interactive with the user/wearer</i></li> <li>• <i>the technology can be invisible to others which is suited to safety requirements such as GPS trackers or security devices.</i></li> <li>• <i>a wide range of aesthetic effects available to improve safety as well as maintain a fun or stylish appearance.</i></li> </ul>				

*Disadvantages*

- *more complicated designs require more complex circuits increasing the manufacturing cost and chances of short circuits and the need for more battery power.*
- *if the battery fails or loses power the garment will not function as a safety device*
- *not always waterproof or durable in extreme weather conditions*
- *the electronic devices must be able to withstand the normal wear and tear of a garment.*

**Guidance to markers**

<ul style="list-style-type: none"><li>• Incorrect / no answer</li></ul>	<b>0</b>
<ul style="list-style-type: none"><li>• Limited understanding and application of knowledge and understanding of the use of reflective materials and application of e-textiles in safety products.</li><li>• There is limited evidence of relevant examples.</li><li>• Quality of Written Communication is limited, presenting material with limited coherence, many errors of grammar, punctuation and spelling.</li></ul>	<b>1 - 2</b>
<ul style="list-style-type: none"><li>• Generally good understanding and application of knowledge and understanding of the use of reflective materials and application of e-textiles in safety products.</li><li>• Limited examples given and answer mainly refers to the product shown in the question.</li><li>• There is a line of reasoning which is generally coherent and relevant.</li><li>• Quality of Written Communication is basic, presenting occasional appropriate material with some coherence, some errors of grammar, punctuation and spelling</li></ul>	<b>3-4</b>
<ul style="list-style-type: none"><li>• Very good understanding and application of knowledge and understanding of the use of reflective materials and application of e-textiles in safety products.</li><li>• Relevant examples given that differ from the ones shown in the question.</li><li>• There is a sustained line of reasoning which is generally coherent, relevant, and substantiated.</li><li>• Quality of Written Communication is good, presenting mainly appropriate material in a coherent manner, few errors of grammar, punctuation and spelling.</li></ul>	<b>5-6</b>
<ul style="list-style-type: none"><li>• Excellent understanding and application of knowledge and understanding of the use of reflective materials and application of e-textiles in safety products.</li><li>• Relevant examples given that show application of both reflective and e-textiles technology.</li><li>• There is a sustained line of reasoning which is coherent, relevant and substantiated.</li><li>• Quality of Written Communication is excellent, presenting wholly appropriate material in a coherent and logical manner, hardly any errors of grammar, punctuation and spelling.</li></ul>	<b>7-8</b>

*Candidates must discuss at least one advantage or one disadvantage in their essay as well as e-textiles and reflective technology.*

(d)	<p>You have been asked to design an innovative fashionable textile product that embraces reflective technology and/or e-textiles for a situation of your own choosing.</p> <p>Your design must include:</p> <ul style="list-style-type: none"> <li>• two specific named appropriate materials</li> <li>• reflective technology and/or e-textiles</li> <li>• at least one style detail that enhances the function of the product</li> <li>• at least one decorative technique that enhances the aesthetics of the product.</li> </ul>			
(i)	<p>quality of communication in terms of an annotated fashion illustration.</p> <p>Candidates need to illustrate and annotate all aspects of their design idea. They must also specify the situation their garment is designed for.</p> <p><b>Guidance to markers</b></p> <p><i>No sketch or the sketch cannot be understood, no annotation.</i></p> <p><i>A very simple sketch technically lacks detail, limited reasoning and justification of choices.</i></p> <p><i>A simple sketch, a small amount of technical detail, limited reasoning and justification of choices.</i></p> <p><i>A reasonable sketch, technically more accurate, simple reasoning and justification of choices.</i></p> <p><i>A good sketch, technically accurate, a simple reasoning and justification of choices demonstrating an adequate level of understanding.</i></p> <p><i>Sketch is technically correct, a good level of understanding with appropriate reasoning and justification of choices demonstrating a good level of understanding.</i></p> <p><i>Sketch is technically correct with detailed annotation that demonstrates a clear understanding. Reasoning is highly appropriate and choices are fully justified.</i></p>		✓	6
				0
				1
				2
				3
				4
				5
				6

(ii)	an innovative fashionable design for your chosen situation	5
	The following should be considered: fashionable, innovative and an original design for a product that will improve the safety of the wearer. Appropriate for the intended situation.	
	<b>Guidance for markers</b>	
	<i>No answer or incorrect answer</i>	<b>0</b>
	Unimaginative simple design with some thought given to intended use though lack of detail. Relates to some areas of design brief/specification but may not be clear, overall balance weak. Minimal or no reference to the situation it is intended for.	<b>1</b>
	Simple design related to many aspects of the design brief with some detail about the design features. Design might lack imagination. There may be some lack of clarity and little detail shown. An existing design may have been replicated or the design may be far-fetched or implausible. Some simple references to the situation it is intended for.	<b>2</b>
	Fairly good design that relates to most aspects of the design brief/specification with some thoughtful or imaginative detail. Little evidence that an existing design has been replicated with one or two creative individual ideas evident. Appropriate for the situation it is intended for.	<b>3</b>
	Imaginative design and creative, detailed product with an effective style detail that improves the function of the product. Unique ideas that could prove to be a popular and fashionable design. Highly appropriate for the situation it is intended for.	<b>4</b>
	Very original, innovative, imaginative and highly creative product. An e-textiles or technical component is central to the design and has been carefully considered. The idea is very unique and could prove to be a popular and fashionable design. All aspects of the design are highly appropriate for the situation it is intended for.	<b>5</b>

(iii)	the justified use of <b>two</b> specifically named appropriate materials	4
	<p>Candidates should label all materials used in their design and give a detailed explanation to fully justify their choices with reference to the suitability of the material in relation to the product.</p> <p><i>Note: Award a maximum of 2 marks if only one material has been named/justified.</i></p> <p><b>Guidance to markers</b></p> <p><i>Incorrect / no answer</i></p> <p><i>Brief description, a simple fact.</i> One or two materials have been named. Little or no reasoning provided to justify choices.</p> <p><i>Some detail in the description with some understanding.</i> One or two materials have been named. Simple justification of choices provided and material choices are either unsuitable or unimaginative.</p> <p><i>A more detailed description with understanding.</i> Materials have been named and suitable reasons given in order to justify choices. Material choices are fit for purpose and enhance the design of the product.</p> <p><i>A clear and very detailed description with understanding.</i> Materials have been named and detailed reasons given in order to justify choices. Material choices are imaginative and highly suitable for the intended use. Good consideration given as to how the materials will enhance the design.</p>	<p><b>0</b></p> <p><b>1</b></p> <p><b>2</b></p> <p><b>3</b></p> <p><b>4</b></p>

(iv)	creative and imaginative use of reflective technology and/or e-textiles	5
	Candidates must show an understanding of how reflective technology and/or e-textiles will help to enhance the function of the product in relation to the intended situation. Reference must be made to how the component/s will function. If the component is concealed the reference must be made to how it will be embedded into the product.	
	<b>Guidance to markers</b>	
	<i>No evidence of reflective technology and/or e-textiles shown in the design sketch or no annotation.</i>	0
	Sketch shows a simple use of reflective technology and/or e-textiles but no reasoning for choice is evident or choice of component is inappropriate for use or implausible.	1
	Sketch shows a suitable use of reflective technology and/or e-textiles but lacks imagination and it may be unclear how the component will work. Simple reasons for choices are annotated.	2
	Sketch shows an imaginative use of reflective technology and/or e-textiles and reasons for choices are clearly annotated. Sketch and annotations show a good understanding of how the component will work.	3
	Sketch shows a highly creative and imaginative use of reflective technology and/or e-textiles and detailed reasons for choices are clearly annotated. Sketch and annotations show a good understanding of how the component will work.	4
	Sketch shows an innovative and original design, highly creative and imaginative use of reflective technology and/or e-textiles and detailed reasons for choices are clearly annotated to show an in-depth understanding of how the component will work. The function of the component may enhance the design in some way as well as providing a safety feature and careful consideration has been given as to how the component can be incorporated into the product.	5
(v)	the use of an appropriate style detail that enhances the function of the product.	2
	The candidate should include a named style detail that enhances the function of the product as part of their sketch and fully justify their choices through the use of labelling and annotation.	
	<b>Guidance to markers</b>	
	<i>Incorrect / no answer</i>	0
	A simple sketch of the style detail technically lacks detail, limited reasoning. The chosen style details may not necessarily enhance the function of the design.	1
	A good sketch showing the style detail, technically more accurate, reasons given for choices and the chosen style detail enhances the function of the design and are appropriate for its intended use.	2

(vi)	the use of at least <b>one</b> decorative technique that enhances the aesthetics of the product.	2
	<p>The candidate should include one or more suitable and imaginative decorative techniques that enhance the aesthetics of the design.</p> <p><b>Guidance to markers</b></p> <p>No evidence of a decorative technique shown in design sketch or no annotation.</p> <p>Sketch shows a decorative technique but no reasoning for choice is evident or choice of technique either lacks imagination or is inappropriate for use.</p> <p>Sketch shows a suitable or imaginative decorative technique and reasons for choices are clearly annotated and highly appropriate for the intended use of the product.</p>	<p><b>0</b></p> <p><b>1</b></p> <p><b>2</b></p>
		<b>Total 40</b>