GCE

Design and Technology

H405/01: Principles of fashion and textiles

A Level

Mark Scheme for June 2024

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

MARKING INSTRUCTIONS

PREPARATION FOR MARKING

RM ASSESSOR

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: RM A*ssessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

3. Log-in to RM Assessor and mark the **required number** of practice responses ("scripts") and the **number of required** standardisation responses.

YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the RM Assessor 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone or the RM Assessor messaging system, or by email.

5. **Crossed Out Responses**
   Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

   Rubric Error Responses – Optional Questions
   Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. Enter a mark for each question answered into RM assessor, which will select the highest mark from those awarded. *(The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.)*

Multiple Choice Question Responses
When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate).

Contradictory Responses
When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**)
Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. *(The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.)*

Short Answer Questions (requiring a more developed response, worth **two or more marks**)
If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response)
Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

7. Award No Response (NR) if:
   - there is nothing written in the answer space.

   Award Zero '0' if:
   - anything is written in the answer space and is not worthy of credit (this includes text and symbols).

Team Leaders must confirm the correct use of the NR button with their markers before live marking commences and should check this when reviewing scripts.

8. The RM Assessor **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
If you have any questions or comments for your team leader, use the phone, the RM Assessor messaging system, or e-mail.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response:
    a. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer
    b. **To determine the mark within the level**, consider the following:

Descriptor	**Award mark**
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

11. **Annotations**

Annotation	Meaning
	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
	Tick
	Benefit of doubt forward (= a mark)
	Level 1
	Level 2
	Level 3
	Noted but no credit given
	Error carried forward (= a mark)
	Repetition
	Highlighter for Level responses

Applying the annotations

Every page must have an annotation stamp on it to indicate you have checked all the pages that are available. If a page is blank, use the 'seen' stamp.

Levels of response questions

- Do **not** use ticks, use the highlighter tool to indicate relevant sections. The number of highlighted sections does **not** equal the number of marks awarded.
- Always stamp the level number at the end of the question, e.g. L2.

Do **not** use crosses.

12. Subject Specific Marking Instructions

INTRODUCTION

Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

You should ensure that you have copies of these materials.
You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet Instructions for Examiners. If you are examining for the first time, please read carefully Appendix 5 Introduction to Script Marking: Notes for New Examiners.

Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

Question and spec links			Answer	Mark	Guidance
1	a		Possible advantages may include: • Non-toxic. Plant-based production requires no or fewer potentially toxic chemicals (1) • Natural/unique design - plant-based material enhances product appearance (1) • Plant-based material is biodegradable (1) • Source is renewable making it more sustainable (1) • Attracts more customers who want to support sustainability (1) Any other valid suggestion.	2	In each case: One mark for identifying an advantage of using a plant-based eco-material for the fabric of the wallet. Specific reference to the context in the question is needed for marks to be awarded. Do not accept 'environmentally friendly' or 'durable' or 'sustainable' unless justified.
	b		Possible plant-based eco-material alternatives may include: • Cork bark (1) • Palm leather (1) • Mushroom leather (1) MuSkin (1) or Mylo (1) or Mycelium leather (1) • Bamboo (1) • Cactus leather (1) • Banana Fibres (1) • Lyocell (1) • Rayon (1) • Cotton (1) • Linen (1) • Viscose (tree pulp) (1) • Hemp (1) Any other valid suggestion.	2	In each case: One mark for identifying a plant-based eco-material alternative which would be suitable to produce the wallet. Specific reference to the context in the question is needed for marks to be awarded. Do not accept 'leaves'

	c		Possible advantages may include: • **Identification:** A circular economy approach makes effective use of bio-based materials (1) **Justification:** By encouraging many different uses for them as they cycle between the economy and natural systems (1) • **Identification:** A circular economy approach addresses wasteful use of resources and adverse impacts (1) **Justification:** Through innovating textile design and adopting new technologies and renewable materials (1) Through increasing the reuse and recycling of old garments (1) By eliminating waste and pollution (1) • **Identification:** A circular economy approach avoids the use of non-renewable resources and preserves or enhances renewable ones (1). **Justification:** By returning valuable nutrients to the soil to support regeneration (1) Using renewable energy as opposed to relying on fossil fuels (1). Any other valid suggestion.	**4**	In each case: One mark for identifying a benefit of using a circular economy approach to explore the design for the wallet. One mark for justifying answer given. Specific reference to the context in the question is needed for marks to be awarded.

	d		**Indicative Content:** **The candidate is expected to demonstrate their understanding of the process involved through a series of annotated sketches and/or notes. There may be variations to the process as indicated but to get into L3 candidates must demonstrate a clear understanding of the end-to-end process.** **Attaching a Popper** • Prepare the fabric: if the fabric is light or medium weight add an interface (Vilene) to the area where the snaps will be applied. • Placement and making the hole: Decide where the popper needs to be placed, mark with a water-soluble marking tool to ensure no marks are left on the fabric and make a hole. Use either a punch tool and hammer or a pair of sharp scissors. • Attach: Pop the long stem part through the hole. Place the adjoining piece over the top and situate them both over the metal block. This should have some ridges which will hold the poppers in place. • Place the curved end of the pressing tool over the stem in the middle and give it a couple of taps with a hammer. Keep the tools upright i.e., perpendicular to the work surface/ metal block or the snap may bend in an unwanted direction. • The metal should be pressed to the sides all the way around holding the popper in place. • Place the outside button in place, with the thinner stem through the hole. On the other side, slot over the *female* piece.	**6**	**Level 3 [5-6 marks]** The candidate demonstrates a good level of detail of the process needed to attach a metal popper/press stud using technical terms and considering any relevant equipment, machinery and materials. Sketches, if used will be clear and supported with relevant notes. The process includes all relevant stages. **Level 2 [3-4 marks]** The candidate will demonstrate a sound level of detail of the process needed to attach a metal popper/press stud using some technical terms and there will be some consideration of any relevant equipment, machinery and materials. Sketches, if used, will for the most part be clear and supported with notes most of which are relevant. The process includes some relevant stages. **Level 1 [1-2 marks]** The candidate will demonstrate a limited level of detail of the process needed to attach a metal popper/press stud with a limited use of technical terms and there will be a basic consideration of any relevant equipment, machinery and materials. Sketches, if used, will be unclear with only basic notes to accompany them. Few relevant stages are included. **0 marks** No response or no response worthy of credit

			• On a flat surface, place the pressing tool over the stem and hammer down. **Attaching a popper using pliers** • Preparation and marking of fabric: Mark fabric with a water-soluble marking tool to ensure no marks are left on the fabric. • Press to remove any creases or wrinkles, begin by setting the cap/socket side of the snap. • Place the popper right side down on the plastic platform of the pliers with the metal prongs facing up. Place the socket into the opposing plastic ring. • Press firmly on the socket to firmly secure in pliers. • Attach: Place fabric into the jaws of the pliers with the right side of the fabric aligning the snap with the markings on the fabric • Squeeze slowly and firmly to secure the popper into the fabric. **Attaching a press stud** • Separate and mark: Separate the halves of the press stud and grab the ball side first. • Mark the position of your ball snap on the underside of the top part of the fabric using a water-soluble marker. • Thread a needle with double the thread making sure the colour matches the colour of the fabric.		

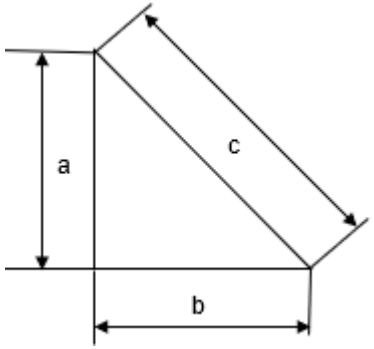
			• Attach: Start stitching with a knot or double backstitch that will lie under the ‘ball’ snap of the press stud. If there is a double layer of fabric, stitch through the top layer for an invisible finish. • Place the needle through one of the holes at the edge of the ‘ball’ snap of the press stud. Then work through each hole with 2-3 stitches to secure it. Use an over-stitch or whipstitch. Make sure you do not have stitches showing on the right side of the garment. • After the first few stitches, move to the next hole by pushing the needle across through the top layer of fabric. In general, there are four holes around the edge of the ‘ball’ snap of the press stud. • Knot off with a stitch concealed under the ‘ball’ snap of the press stud and remove loose threads. • Mark and measure the position of the second side of the press stud with a pin, or sew the ball side in place first, rub tailor chalk on the tip of the ball and press it over to the place where it will meet the socket on the fabric. • Repeat for the socket side of the press stud. Sew the socket side on the top of the underside of the fabric.		

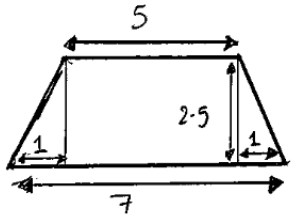
	e		Possible advantages may include: • **Advantage:** The system is designed to be highly flexible (1) **Expansion:** allowing style changes and better line balancing (1) • **Advantage:** Productivity of human labour increased (1) **Expansion:** reducing supplies of unfinished production (1) • **Advantage:** Peer pressure encourages a team spirit (1) **Expansion:** which discourages absenteeism thereby improving production (1) • **Advantage:** Removes transportation time between factories (1) **Expansion:** All the stages are completed in one place (1) Any other valid suggestion. Possible disadvantages may include: • **Disadvantage:** High capital investment is needed in initial and continued training of workers (1) **Expansion:** this is required so that workers can deal with several tasks at one station for process to be effective (1) • **Disadvantage:** Workers are responsible for quality of the products (1) **Expansion:** this could be detrimental to the quality of products (1) • **Disadvantage:**	**4**	One mark for identifying an advantage of using MPS to manufacture the wallet. One mark for explaining this advantage. **AND** One mark for identifying a disadvantage of using MPS to manufacture the wallet. One mark for explaining this disadvantage. Specific reference to the context in the question is needed for marks to be awarded.

			Product quality may be compromised as all levels of operators are involved in the work (1) **Expansion:** there could be a chance for a lot of mix up, shade and size variation (1) • **Disadvantage:** Operators cannot develop the rhythm and pace of high-performance manufacture (1) **Expansion:** this type of production system becomes costly which impacts on product costs (1). Any other valid suggestion.		
	f		**Indicative Content:** **Human impact:** When we use natural resources such as raw materials, we influence the environment, which can lead to deforestation, rising temperatures, loss of biodiversity and extinction of animal and plant life. Sourcing and extracting natural raw materials can produce both an ecological and social footprint. Natural raw materials used for energy – fossil fuels are concentrated organic compounds found in the Earth's crust. Using fossil fuels to generate energy has a significant environmental impact. Burning fuels produces waste products such as sulphur dioxide, nitrogen oxide and other volatile organic compounds which contribute towards global warming. The generation of energy has contributed greatly to atmospheric pollution. Advantages: raw materials such as coal, gas are readily available and easy to transport. Disadvantages: use of fuel based raw materials such as coal will eventually run out as they are non-renewable, finite resources. Visual impact of extraction and large sticks needed.	**6**	**Level 3 [5-6 marks]** The candidate has a clear understanding of the implications of using natural raw materials for textile products. They produce a thorough discussion in relation to the question. The explanation is clear and well-developed and a number of examples are used to exemplify the points being made. **Level 2 [3-4 marks]** The candidate has a reasonable understanding of the implications of using natural raw materials for textile products. They produce a reasonable discussion in relation to the question. The explanation is sufficient although one or two opportunities are missed in referring to different examples. **Level 1 [1-2 marks]** The candidate has a basic knowledge of the implications of using natural raw materials for textile products. Any reference to this issue is descriptive in nature and has little appreciation

			Natural raw materials such as wood, sugar cane etc (Biomass Fuel) can also be burnt to generate heat and steam which is used to turn turbines. These raw materials are readily available, low-cost products however, a downside to this process is that it requires a large amount of raw materials, pollutes the air and can be seasonal. **Fabrics:** Natural raw materials such as eucalyptus is becoming a better alternative to bamboo which needs to be from managed plantations to avoid endangering the species. Eucalyptus provides good quality fibres with less waste making it a better option for the environment. Using organic cotton or other raw natural fibres that are grown without pesticides can help to conserve water and reduce pollution. Nordic innovators Spinnova, Infinited Fibre, Kuura, Ioncell are developing new types of sustainable fibres from cellulose and waste materials such as straw.		of effects. The response contains no analysis or evaluation. **0 marks** No answer or answer not worthy of credit.
2	**a**		P(faulty pair of walking boots) = 20/500 = 0.04 [1] = 4% [1]	**2**	Award two marks as follows: One mark for correct calculation of 20/500. One mark for converting answer to %. If correct answer is given without working out shown award full marks. Where an incorrect answer is given working out should be used to credit appropriate marks.

	b	**i**	Mode of the women's boot sizes = sizes 5 and 6 [1]	**1**	One mark for identifying mode of the women's boot sizes.
		ii	Mode of the men's boot sizes = size 9 [1]	**1**	One mark for identifying mode of the men's boot sizes.
		iii	The number of women with size 7 = 48 [1] Proportion of women with size 7 shoes = 48* / 323 = 0.14860681* x 100 = 14.860681*% [1] = 14.9*% [1]	**3**	Award three marks as follows: One mark for correct extraction of 48 from the chart. One mark for calculating proportion as a percentage. One mark for rounding answer to **1** decimal place. If correct answer is given without working out shown award full marks. Where an incorrect answer is given working out should be used to credit appropriate marks. *Allow error carried forward (ECF) where correct working out is shown.
	c	**i**	There are 2 right angled triangles and a rectangle.	**4**	Award four marks as follows: One mark for calculating sides a and b. One mark for calculating area of one right-angled triangle.

			 a = 2.5cm, b = (7-5)/2 = 2 / 2 = 1 cm [1] Area of a right-angled triangle = (ab) / 2 = (2.5 x 1) / 2 = 1.25cm^2 [1] There are two right-angled triangles and therefore: 1.25 x 2 = 2.5cm^2 Area of rectangle is 5 x 2.5 = 12.5cm^2 [1] Therefore area of x = 12.5 + 2.5 = 15cm^2 [1] OR Area of trapezium = ½(a+b)h		One mark for calculating area of rectangle. One mark for calculating total surface area of x **Note:** Accept if candidates use the fact that 2 triangles forms a square and therefore it is 2.5 x 1 = 2.5 cm^2

			 area = $(2.5 \times 5) + 2\times\left(\frac{1 \times 2.5}{2}\right)$ = $12.5 + 2.5$ = $15\ cm^2$ Candidate example answer. 4 marks		
		ii	Tan ø = opp/adj = 2.5/1 = 2.5 [1] Arctan (tan^{-1}) of 2.5* = 68.1985905136*^{0} [1] Rounding to 1 decimal place = 68.2*^{0} [1]	**3**	Award three marks as follows: One mark for calculating tan of ø. One mark for calculating arctan. One mark for rounding to **1** decimal place. If correct answer is given without working out shown award full marks. Where an incorrect answer is given working out should be used to credit appropriate marks. *Allow error carried forward (ECF) where correct working out is shown.

		iii	Internal length measurement = 35 – 1 = 34cm Internal width measurement = 25 – 1 = 24cm Internal height measurement = 10 – 1 = 9cm [1] Internal volume of box without lid = 34* x 24* x 9* = 7344*cm^3 [1] Covert to m^3 = 7344* / 1000000 = 0.007344*m^3 [1] OR $7.344x10^{-3}$ [1]	**3**	Award three marks as follows: One mark for calculating three internal measurements. One mark for calculating volume in cm^3. One mark for converting to m^3. If correct answer is given without working out shown award full marks. Where an incorrect answer is given working out should be used to credit appropriate marks. *Allow error carried forward (ECF) where correct working out is shown.

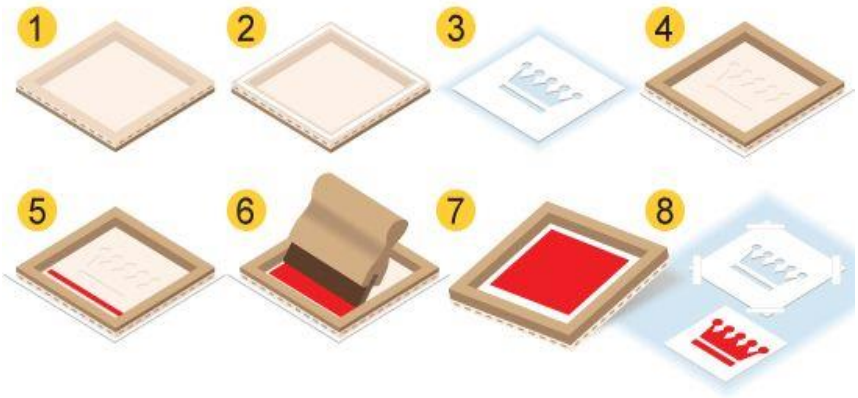
3	**a**		Possible factors may include: • **Identification:** Planning for accuracy and efficiency through testing and prototyping (1) **Justification:** to ensure correct detailing of tolerances and surface finish (1) to ensure parts can be manufactured accurately, efficiently, and economically (1) • **Identification:** Being aware of issues relating to different scales of production (1) **Justification:** reduction of the number of parts in a product will reduce manufacturing costs (1) dealing with fewer parts means less handling, processing time and assembly difficulty (1) • **Identification:** Designing for repair and maintenance (1) **Justification:** to facilitate greater repair and reuse of materials (1) to improve the lifespan of a product (1) • **Identification:** No seams (1) **Justification:** Makes the garment stronger and can improve the aesthetics and comfort as the customer may find the seams irritation on the skin (1) • **Identification:** Designing with consideration of product life (1) **Justification:** to evaluate and reduce the environmental impact of the product on the environment (1) to consider how to reduce the energy that the manufacturing process consumes (1) to consider how to reduce hazardous waste materials that are produced (1)		In each case: One mark for identifying a factor a designer needs to consider when developing designs for whole garment knitting. One mark for justifying answer given. Specific reference to the context in the question is needed for marks to be awarded.

			Any other valid solution.		
	b*		**Indicative Content:** Producing a garment through whole garment knitting (knitting the whole piece as one construction) means there is no requirement for seams, which can be a weak point in a knitted garment making it susceptible to wear and tear. Seams can also hinder the aesthetics of a garment. Manufacturer benefits of whole garment knitting include: • Elimination of labour intensive cutting and sewing • Little waste due to no fabric cutting • A reduction in manufacturing lead time as garments are quicker to produce • Results in a more consistent finished product • Whole garment knitting also has environmental benefits since there is no need for separate pieces to be cut and sewn together, there is less waste generated during the production process Consumer benefits of whole garment knitting include: • Reduced need for seams, meaning less bulk • Stronger garments due to fewer seams • Garments with improved draping characteristics due to less bulk created by the seams • Seams no longer interfere with the natural elasticity of knits, so the consumer can move and stretch more freely • Seamless one-piece construction means that the entire garment has the structural integrity of a single piece of fabric, allowing stress to be distributed evenly • Strong and resilient knitwear Fully fashioned knitting, on the other hand involves the construction of a garment using individually created pieces which	**8**	**Level 3 [6-8 marks]** The candidate has a clear understanding of the benefits of whole garment knitting compared to fully fashioned knitted panels. They produce a thorough discussion in relation to the question. The explanation is clear and well-developed with references being made to both the manufacturer and the consumer to exemplify the points being made. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated with the use of examples.* **Level 2 [3-5 marks]** The candidate has a reasonable understanding of the benefits of whole garment knitting compared to fully fashioned knitted panels. They produce a reasonable discussion in relation to the question. The explanation of benefits in relation to the manufacturer and/or consumer is sufficient although one or two opportunities are missed to exemplify the points being made. *There is a line of reasoning presented with some structure. The information presented is for the most part relevant and supported by some evidence.* **Level 1 [1-2 marks]** The candidate has a basic knowledge of the benefits of whole garment knitting compared to

			are then joined together. It is very distinctive and easily identifiable by the fashioning marks which normally run parallel to the garment seams. The fashioning marks are created as the shaping takes place when knitting the panels. Manufacturer benefits of fully fashioned knitting include: • Like whole garment knitting, creating each piece individually before joining the pieces together reduces the amount of waste as no cutting out is required • Complex styles can be created without visible seam lines as a process known as 'linking' is used so the join lies flat which encourages more sales Consumer benefits of fully fashioned knitting include: • Complex shapes can be created for the perfect fit • Fully fashioned knitwear designs make use of patterns on the fabric as the pattern will not be disrupted as the parts are sewn together.		fully fashioned knitted panels. Any reference to this area is descriptive in nature and has little appreciation of the benefits to the manufacturer or consumer.. The response contains no analysis or evaluation. *The information has some relevance and is presented with limited structure or detail. The information is supported by limited evidence.* **0 marks** No response or no response worthy of credit. Where a candidate discusses whole garment knitting only, award maximum L2.
4	**a**		Possible benefits may include: • **Identification:** Soft, woven fabrics are comfortable for baby to wear (1) **Justification:** prevents skin irritation/lack of sleep from the sensor system (1) • **Identification:** Woven fabrics are more durable (1) **Justification**: can withstand the wear and tear/ movement of built-in sensors (1) Any other valid suggestion.	**2**	One mark for identifying a benefit of embedding the sensor system of the baby monitoring jacket into a soft, woven fabric. One mark for justifying answer given. Specific reference to the context in the question is needed for marks to be awarded.

	b	**i**	Possible reasons may include: • **Identification:** Allows the designer to print small orders/batches/limited edition lines (1) **Justification**: because it is a cost-effective technique (1) • **Identification:** Quick technique to complete (1) **Justification:** with digital printing technology it is possible to go from the design stage to finished fabric in a matter of days/weeks (1) speed of completion allows designer/manufacturer to change prints, even colours, mid-season if needed (1) • **Identification:** Digital printing gives a photorealistic, vibrant image (1) **Justification:** print tends to sit on the surface of the fabric rather than absorbing (1) Any other valid suggestion.	**4**	In each case: One mark for identifying a reason why the designer of the baby monitoring jacket has used digital printing for the animal logos. One mark for justifying the reasons given. Specific reference to the context in the question is needed for marks to be awarded.

		ii	**Indicative Content:** **The candidate is expected to demonstrate their understanding of the process involved through a series of annotated sketches and/or notes. There may be variations to the process as indicated but to get into L3 candidates must demonstrate a clear understanding of the end-to-end process.** *Screen printing is the process of transferring a stencilled design onto a flat surface using a mesh screen, ink and a squeegee.* **Method 1:** Stencil Screen Printing Method 1. Stretch fabric over a screen (wooden/plastic). 2. Attach the fabric by stretching around the screen and securing in place with a staple gun, keeping the fabric taut. 3. Create a stencil – start by drawing an image or download a pre-made stencil design. Cut it out using a craft knife. 4. Place stencil on screen and secure with a small amount of tape. 5. Apply dye/ink to one edge of the screen. 6. Use a squeegee blade to evenly spread dye over the stencil. Complete a test print before attempting the finished piece to get the correct pressure on the squeegee. 7. Check for an even spread by gently lifting the screen. 8. Remove the screen and leave design to air dry before fixing the dye using a heat press or iron. The print will need to be cured for 2-3 minutes.	**6**	**Level 3 [5-6 marks]** The candidate demonstrates a good level of detail of the process needed to apply the animal logos using screen printing. Technical terms and considering any relevant equipment, machinery and materials are used. Sketches, if used will be clear and supported with relevant notes. The process includes all relevant stages. **Level 2 [3-4 marks]** The candidate will demonstrate a sound level of detail of the process needed to apply the animal logos using screen printing. Some technical terms are used and there will be some consideration of any relevant equipment, machinery and materials. Sketches, if used, will for the most part be clear and supported with notes most of which are relevant. The process includes some relevant stages. **Level 1 [1-2 marks]** The candidate will demonstrate a limited level of detail of the process needed to apply the animal logos using screen printing. A limited use of technical terms evident and there will be a basic consideration of any relevant equipment, machinery and materials. Sketches, if used, will be unclear with only basic notes to accompany them. Few relevant stages are included. **0 marks** No response or no response worthy of credit



Method 2: Light-reactive emulsion method

- Design is printed out onto a transparent acetate film. This will be used to create the stencil.
- A mesh screen to suit the complexity of the design, and the texture of the fabric being printed is prepared. The mesh screen is then coated with a layer of light-reactive emulsion, which will harden when developed under bright light.
- The acetate sheet with the design is laid onto the emulsion-coated screen, and the whole thing is exposed to a very bright light. The light hardens the emulsion, so the parts of the screen which are covered by the design remain in liquid form.
- If the final design is going to include more than one colour, then a separate screen must be used to apply each layer of ink.
- After the screen has been exposed for a set time, the areas of the screen not covered by the design will have turned hard. Any unhardened emulsion is then carefully rinsed away. This

			leaves a clear imprint of the design on the screen for the ink to pass through. • The screen is then dried, any necessary touch-ups or corrections to make the imprint as accurate as possible to the original design are made. The stencil is now ready to be used. • The screen is lowered down onto the printing board. Ink is added to the top end of the screen, and a squeegee is used to pull the ink along the full length of the screen. This presses the ink through the open areas of the stencil, imprinting the design on the product underneath. • At the end of the process any excess emulsion is removed using a special washing fluid so the mesh can be reused to create new stencils. • The printed fabric passes through a dryer, which 'cures' the ink and creates a smooth, colourfast finish. The final product is checked and washed thoroughly to remove any residue.		

	c		Possible quality checks may include: **Simple visual check** (1) • check that colours are consistent, clear and not blurred (1) • If the colour is faded, is ink strong enough not to allow fibres from breaking through (1) • Checking accuracy of dimensions/design (1) • Check there are no misprints (1) • Check logos are specified dimensions and consistent in size (1) **Check functionality** (1) • washability, colour-fast **Flammability test** (1) • check safety for use on a child's textile product (1) • meets British safety regulations/requirements (1) Any other valid suggestion.	**1**	One mark for identifying a quality control check that should be carried out on the finished screen-printed animal logos. Specific reference to the context in the question is needed for marks to be awarded.
	d		Possible reasons may include • **Identification:** Velcro is soft and gentle on the skin (1) **Justification:** reduces irritation and discomfort for baby (1) • **Identification:** Allows for quick and easy changes (1) **Justification:** makes changing/fastening jacket easier and quicker whilst infant is moving (1) • **Identification:** Easy care (1)	**4**	In each case: One mark for identifying a reason why a Velcro fastening is a useful feature on this product. One mark for explaining reason given. Specific reference to the context in the question is needed for marks to be awarded.

			Justification: can be machine washed or dry cleaned (1) • **Identification:** Adjustable (1) **Justification:** making it suitable for different sizes (1) Any other valid suggestion.		
	e		Possible factors may include: • **Identification:** Is fusing required (1) **Justification:** Applying another layer to the main fabric to reinforce it at various places (1) To strengthen the areas where the Velcro will be stitched (1) or the sensors will be attached (1) Ensure that the weight of the interfacing/fusing material is a similar weight to the main fabric (1) • **Identification:** Decorative features/ stitching considered (1) **Justification:** Digital printing of animal logos completed before lining is added to prevent seepage of dyes through to main fabric (1) Easier and quicker to commercially produce on machinery if single layer of fabric is used (1) • **Identification:** Addition of working parts (1) **Justification:** Velcro is usually attached/machine stitched into place near the end of manufacture of the jacket as it might interfere with the assembly process (1) Wearable sensors attached at the end of manufacture to ensure correct positioning (1) and to reduce possible damage during assembly process (1)	**4**	In each case: One mark for identifying a factor that needs to be considered when deciding the order of assembly for a final prototype of the baby monitoring jacket. One mark for justifying factor given. Specific reference to the context in the question is needed for marks to be awarded.

			Any other valid suggestion.		
	f		**Indicative Content:** Medical textiles represent fabric structures designed for a medical application ranging from a single thread suture to the complex composite structures for bone replacement and from the simple cleaning wipe to advanced barrier fabrics used in operating rooms. Textile materials and products are now designed to be suitable for any medical and surgical application where a combination of strength, flexibility and sometimes moisture and air permeability are required. Using e-textiles to enhance healthcare: • Can act as a second skin and are designed for comfort and functionality, • Help to monitor and communicate a patient's condition by detecting, storing, analysing, and transmitting physiological signals • Help with diagnostics, disease prevention, and treatment • Conductive threads can function as sensors and data transfer systems to alert wearer to changes in body function • Wearable biosensors (WBS) are portable electronic devices that integrate sensors into or onto the human body in the form of gloves, clothing, or implants. Designed to be less invasive and painful, and provide real-time measurements of biochemical (e.g. sweat, saliva, tears) and biological (e.g. sleep, blood pressure, respiration) markers • Can be used in the treatment of precancerous skin conditions, neurological conditions, light drug delivery, and pain management • Wearable technology can detect unexpected fall of respiratory rate, heart rate, and oxygen level alleviate patient anxiety by notifying sudden critical situations. **Examples:**	**6**	**Level 3 [5-6 marks]** The candidate has a clear understanding of how new and emerging technologies influence and inform the function and innovation of medical textiles. They produce a thorough discussion in relation to the question. The explanation of how these technologies influence and inform is clear and well-developed and a number of examples linked to function and innovation are used to exemplify the points being made. **Level 2 [3-4 marks]** The candidate has a reasonable understanding of how new and emerging technologies influence and inform the function and innovation of medical textiles. They produce a reasonable discussion in relation to the question. The explanation of how these technologies influence and inform is sufficient although one or two opportunities are missed in referring to different examples linked to function and/or innovation. **Level 1 [1-2 marks]** The candidate has a basic knowledge of how new and emerging technologies influence and inform the function and innovation of medical textiles. Any reference to this issue is descriptive in nature and has little appreciation of how technologies influence and inform the function or innovation of medical textiles. The response contains no analysis or evaluation.

			Patient gowns are the most recent garment to undergo a tech upgrade. In some hospitals, e-gowns allow doctors to monitor vital signs through electrodes woven into the gown fabric. For patients undergoing cardiac rehabilitation, this data can be aggregated over time, and measure the effectiveness of the rehab plan. Blood oxygen monitors, also known as pulse oximeters, are commonly found in hospitals. Fabric wristbands are now available with integrated blood oxygen monitors. The sensors in these wristbands can send data to an app on the user's smartphone. **Disadvantages of e-textiles:** • The regulatory authorisations needed to approve them in a medical context are lengthy and expensive. • In addition, smart textiles that rely on data capturing to fulfil their function present privacy and ethical issues regarding how personal information is stored, shared and sometimes sold.		**0 marks** No answer or answer not worthy of credit.

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