GCE

Design and Technology

H405/01: Principles of fashion and textiles

A Level

Mark Scheme for June 2023

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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 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
BP	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
✗	Cross
CON	Confused (replaces the question mark)
BOD	Benefit of doubt
KU	AO1 – Knowledge and understanding
APP	AO2 – Apply knowledge and understanding
AN	AO3 - Analyse
EVAL	AO4 - Evaluation
^	Omission
NAQ	Not answered question
SEEN	Noted but no credit given
TV	Too vague
OFR	Own figure rule

REP	Repetition

12. Subject Specific Marking Instructions

INTRODUCTION

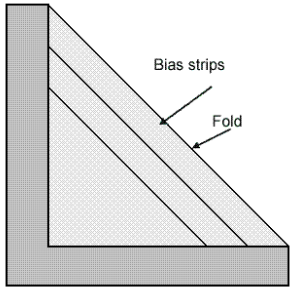
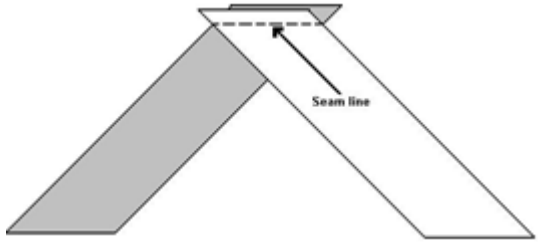
Your first task as an Examiner is to become thoroughly familiar with the material on which the examination depends. This material includes:

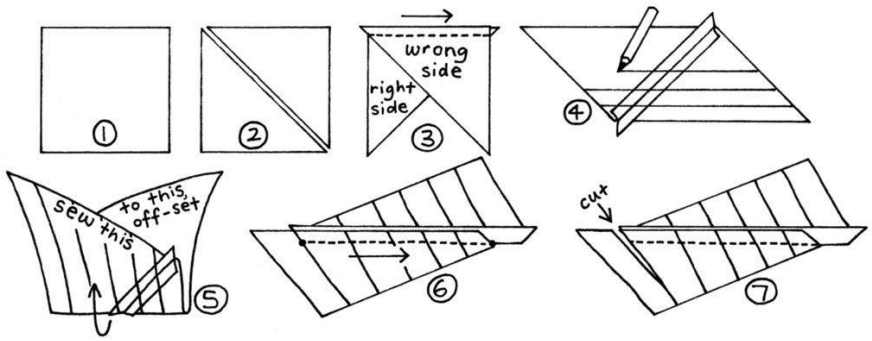
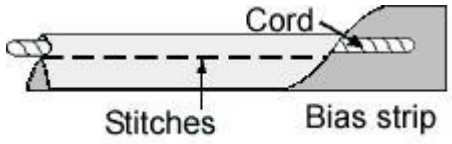
- the specification, especially the assessment objectives
- the question paper
- the mark scheme.

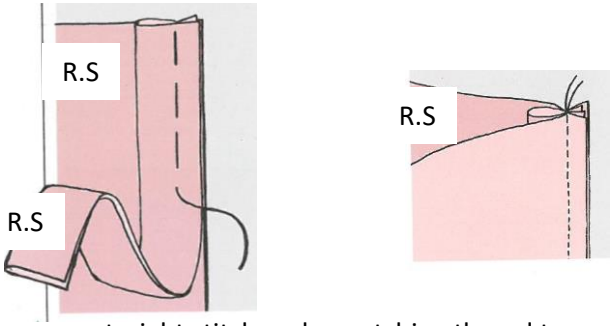
You should ensure that you have copies of these materials.
You should ensure also that you are familiar with the administrative procedures related to the marking process. These are set out in the OCR booklet Instructions for Examiners. If you are examining for the first time, please read carefully Appendix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

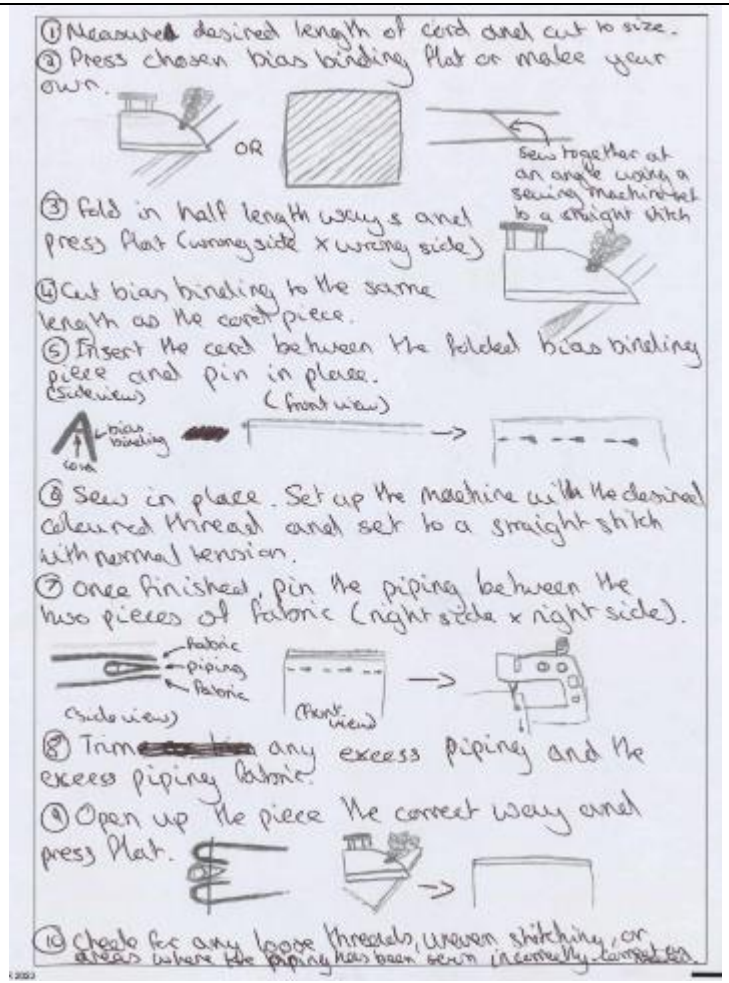
Please ask for help or guidance whenever you need it. Your first point of contact is your Team Leader.

Question and spec links			Answer	Mark	Guidance
1	(a)		Possible advantages may include: • Excellent abrasion/wear resistance (1). • High tensile/compressive strength (1). • Lightweight (1). • Good resistance to corrosion (1). • Durable (1). • Can handle excessive temperatures (1). • Will resist water but is not waterproof (1). • Any other suitable response.	2	In each case: One mark for stating an advantage of using nylon fibres for the fabric of the quilted pallet cover.
1	(b)		Possible reasons may include: • Adds insulating properties (1) as it traps air to keep products at required temperatures/it keeps them cool or warm (1). • Decorative/appeal (1) which helps to promote sales (1). • Extends durability/strength with the layers of fabric (1) which helps resistance to wear and tear (1). • Protection of consumables/goods (1) as the quilting adds padding to help protect the contents from physical damage (1). • Less likely to be damaged by water (1) the extra layers will help absorb the water before it reaches the items inside (1). • Any other suitable suggestion.	4	In each case: One mark for identifying a reason why quilting the nylon fabric makes the pallet cover suitable for its intended purpose. One mark for justifying why the reason given is suitable in this context. Specific reference to the context in the question is needed for marks to be awarded. Mix and match approach to bullet points to be taken.

1	(c)		***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.*** **Indicative Content:** **<u>Making own bias binding (cross-way strips)</u>**  • Fold the fabric diagonally on the bias to create bias strips. • The width of the strips should be the circumference of the piping cord being used plus twice the seam allowance needed. • Cut as many strips as needed to outline the area that you will be piping. You will also need extra fabric for the seam allowances. • Sew the bias strips together to form a strip as long as the edge to be piped and the seam allowances needed. Press seams open.  	**6** All processes demonstrated must relate to free-machine embroidery. If candidate does not provide an analytical/evaluative response, then only L1 can be awarded.	**Level 3 [5-6 marks]** The candidate demonstrates a good level of detail of the process needed to make and insert a piped trim 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 make and insert a piped trim using some technical terms and there will be some consideration of any equipment, machinery and materials required. 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 make and insert a piped trim with a limited use of technical terms and there will be a basic consideration of any equipment, machinery and

			• Alternative method to create a long bias strip.  • Commercially produced bias binding could also be used. Available in various widths, choose the one wide enough to wrap around the piping cord being used leaving enough fabric for it to be inserted into a seam. **Using the bias binding for soft corded or corded piping.** • Lay a strip of cording down the centre of the bias tape and fold the tape around the cord. The right side of the bias should be visible  		materials required. 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.

			Attaching the piping • The piping (with or without cord) is inserted between the layers of fabric when the seam, or hem, is made. The piping is placed as shown in the diagram so that when the seam is stitched, the folded edge of the piping shows on the right side of the product and the raw edges are inside.  • Pin, tack and then use a straight stitch and a matching thread to machine stitch in place. • Cut V-shaped slits into the corners and curved edges. • Any other suitable response.		


1 Measure desired length of cord and cut to size.
2 Press chosen bias binding flat or make your own.
OR
Sew together at an angle using a sewing machine set to a straight stitch
3 Fold in half length ways and press flat (wrong side x wrong side)
4 Cut bias binding to the same length as the cord piece.
5 Insert the cord between the folded bias binding piece and pin in place.
(side view)
(front view)
bias binding
cord
6 Sew in place. Set up the machine with the desired coloured thread and set to a straight stitch with normal tension.
7 Once finished, pin the piping between the two pieces of fabric (right side x right side).
fabric
piping
fabric
(side view)
(front view)
8 Trim any excess piping and the excess piping fabric.
9 Open up the piece the correct way and press flat.
10 Check for any loose threads, uneven stitching, or areas where the piping has been sewn incorrectly, corrected.

1	(d)		**Indicative Content:** • **Methods of laminating** – strengthen fabrics by combining two or more layers Usually bonded together using a polymer film or membrane by using heat, adhesives and pressure. This process enables a material to have properties that it would not normally have when functioning on its own. Examples: Medical and hygiene - waterproof breathable hydrophilic membranes. Furniture/upholstery - laminating foam to furnishing fabrics to add strength and comfort, prevent wear and tear/decay. • **Chemical finishes** - involves the application of chemical solutions or resins to either the face or the back of the fabric. Example: Stain resistance – Teflon & Scotchgard, where silicones are applied to resist water-based stains. Synthetic resins are applied to fabrics to resist oil-based stains. Application of insect-resistant finishes to carpets, wall hangings, upholstery fabrics, furs, or uniforms to prevent decay/degradation. (Moth resistant finishes which make wool and hair fibres unfit food for moths and carpet beetles. E.g., Mitin). Dip and cautious spray applications are used for the protection of wool and silk textile exhibits in museums. Softeners and abrasion-resistant finishes are added to improve the ability of the textile to resist abrasion and tearing. Anti-bacterial finishes retards growth of bacteria and fungi. • **Mercerising** - Form of chemical finishing. Cotton fibres are treated with a solution of sodium hydroxide, making them stronger. • **Transparent coatings on fine fabrics** – Silicone coatings provide unique functional benefits in a variety of apparel items. For example, Nanotechnology can be used on	6	**Level 3 [5-6 marks]** The candidate has a clear understanding of a range of ways textile products can be finished to prevent corrosion or decay to enhance their performance. They produce a thorough discussion in relation to the question by discussing these finishes. The discussion is clear, backed up by relevant and in context examples. **Level 2 [3-4 marks]** The candidate has a reasonable understanding of a range of ways textile products can be finished to prevent corrosion or decay to enhance their performance. They produce a sound discussion in relation to the question by explaining these finishes are applied. The explanation is sufficient although one or two opportunities are missed to add depth to examples provided. **Level 1 [1-2 marks]** The candidate has a basic knowledge of how finishes can be applied to textile products. Any reference to the types of finishes is limited and has little appreciation of how and why they are used in this context.

			delicate and luxury fabrics that repel liquids and resist stains. Help retain the delicate feel and look/appearance for longer. • **Calendering** - a process which: Flattens the fabric Seals the weave Leaves one side of the fabric shiny while the other is matte/dull. This process is done to make the fabric down-proof (stiffer) and increase wind resistance. Helps prevent degradation. • Any other suitable response.		The response contains no analysis or evaluation, with few or no relevant examples. **0 marks** No answer or answer not worthy of credit.
1	**(e)**		Possible factors may include: • **Introduction onto the market** (1) **Expansion -** determines the stakeholders that will be involved in the whole lifecycle process (1). Identifies the target market and identify how to reach it effectively (1). Carrying out surveys at the prototype stage with the target market which can give designers/manufacturers constructive feedback (1). • **Market penetration** (1) **Expansion -** stage where highest monetary investment is required (1). There are high costs involved for product design and development (1) Products are not profitable at this stage due to low sales and lack of product awareness (1). Retailers need to be assured/feel confident that product will make a profit, when stocking new products like the pallet cover. (1).	**4**	In each case: One mark for identifying a factor a manufacturer needs to consider when assessing the marketing lifecycle of a product such as the quilted pallet cover. One mark for describing the factor that has been identified. Specific reference to the context in the question is needed for marks to be awarded.

			• **Pricing strategy** (1) **Expansion** - it is crucial to ensure that pricing is correct to attract buyers (1). The manufacturer will need to decide on the pricing strategy that they feel will be the most appropriate to attract sales (1). This type of pricing gives an edge to the company because customers are attracted to the price and could decide to switch brands (1). • **Growth** (1) – **Expansion -** where the popularity of the product is gradually increasing and sales steadily growing (1). Ideal stage to make improvements to the product to maintain customer interest (1). Creating new users for the product by expanding the market through further advertising and marketing (1). • **Maturity** (1) – **Expansion -** sales reduce and the profit margins start to decline (1). Sales reduction could be due to market saturation or the introduction of other brand products (1). Expansion into international markets or introducing new features can extend the marketing life of the product (1). Product needs to be designed to allow for expansion (1). • **Decline** (1) – **Expansion -** this stage happens when the market is saturated with the product (1). It is important that the manufacturer/company can predict this stage and have a strategy to exit the product from the market to prevent profit loss (1). An exit strategy normally coincides with a new product (1). • Any other suitable response.		

1	**(f)**		Possible negative effects may include: Fossil Fuels • Air pollution (1) in the form of carbon dioxide sulphur dioxide (1). • Extraction process (1) visual impact/dust clouds/noise (1). • Storage (1) visual impact/noise (1). • Water/ground pollution (1) contamination from oil leaks when transporting via pipeline or ship/impact on wildlife (1). Hydro Electric • Water course diversion/flooding / (1) damages habitats/ wildlife affected/move/die out (1). • Structures in the water (1) impact on wildlife, e.g., salmon unable to return to spawning grounds/animals trapped in the structure (1). Wind • Impact of structures (1) unsightly/ take up a lot of space destroy habitats/disorientate birds/killed as fly into them (1). • Noise pollution (1) can affect wildlife causing them to migrate or stop breeding (1). Tidal barrages • Can damage habitats (1) wildlife may die out / move to another area/ affect biodiversity (1) Geothermal • Pollution (1) release of greenhouse gases like hydrogen sulphide, carbon dioxide, methane and ammonia (1). • Earthquakes change the environment in the area (1) and affect habitats/changing the wildlife population (1) Biomass • Air pollution (1) in the form of carbon dioxide sulphur dioxide (1). • Any other suitable response	**4**	One mark for identifying a negative impact on the environment of using natural sources of energy to manufacture products such as the quilted pallet cover. One mark for explaining this negative impact. Mix and match approach to bullet points to be taken.

2	**(a)**		Calculate total of ratios: 4:8:7:6 = 4+8+7+6 = 25 [1] No of T-shirts per unit ratio 4000/25* = 160 [1] S = 4 x 160* = 640 M = 8 x 160* = 1280 [1 for S+M] L = 7 x 160* = 1120 XL = 6 x 160* = 960 [1 for L+XL]	**4**	Award four marks as follows: One mark for calculating total ratios. One mark for calculating T-shirts per unit ratio. One mark for calculating total T-shirts for S and M. One mark for calculating total T-shirts for L and XL. 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.
2	**(b)**	**(i)**	(4000/7000)*100 = 57.1428571% [1] 100% - 57.1428571*% = 42.8571429% [1] Calculate to 2 dec places = 42.86% [1]	**3**	Award three marks as follows: One mark for calculating percentage difference. One mark for calculating

					percentage decrease. One mark for rounding answer to 2 decimal places. 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.
2		**(ii)**	9000+7000+5000 = 21000 [1] 21000 / 3 = 7000 [1]	**2**	Award two marks as follows: One mark for calculating total sales over three years. One mark for calculating mean sales. 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.
2	**c**		90% of 105 T-Shirts = 94.5 [1] No of faulty T-shirts = 105 – 94.5* = 10.5* [1] = 11* T-shirts (can only be presented as complete T-Shirts) [1] Probability value = 11* / 7000 = 0.00157142857* [1] Rounded to 4 dec places 0.0016* [1]	**5**	Award five marks as follows: One mark for calculating the number of faulty T-shirts at 90%. One mark for calculating the reduced rate of faulty T-shirts. One mark for stating to the number of complete T-shirts. One mark for calculating the probability. One mark for rounding answer to four decimal places. 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.

2	**(d)**		Possible information may include: • **Fibre content** (1) Some consumers have allergies to certain fibres/moral objections to their use (1). • **Country of origin** (1) Some consumers prefer to support particular countries and avoid others (1). • **Flammability** (1) Consumers need to be aware if a product is flammable and so be able to take steps to protect themselves/not buy the product if they feel it would put a user at risk (1). • **Size of garment** (1) Allows consumers to select the appropriate sized garment in the shop/check they have received the correct size if ordered online etc. (1). • **Manufacturer/retail outlet** (1) They use this code to return a faulty product / contact the manufacturer (1). • **Brand Label (1)** Some consumers prefer a particular brand/status symbol (1). • **Colour** (1) **D**ifficult to distinguish colours in artificial light e.g., dark blue from black/colour blind/visual impairment (1). • Any other suitable response.	**2**	One mark for identifying one piece of information which could be included on the label attached to the T-shirt. One mark for justifying why this information is important to the end-user.

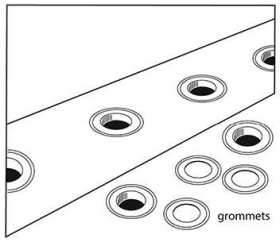
3	**(a)**		Possible benefits may include: • Soft (1) which help to relax the muscles in the hands and relieve pain (1). • Quiet/does not make a noise when squeezed/touched (1), which is calming (1). • Self-soothing/texture/softness (1) acts as a sensory distraction helper (1). • Stimulates fine motor skills and concentration (1), which reduces anxiety/stress (1). • Squishy/easy to shape and wrap around the fingers (1) fantastic stress relief (1). • Chunky (1) easy to hold (1). • Any other suitable response.	**4**	In each case; One mark for identifying a benefit to the user of the sensor fidget toy being made from chenille yarn. One mark for explaining this benefit. Specific reference to the context in the question is needed for marks to be awarded.
3	**(b)***		**Indicative Content:** Fancy yarns can add the following characteristics to fabrics / products: • Bulk - makes fabric look and feel thicker • Elasticity - stretch/comfort / reduce creasing and ironing / easy care • Absorbency - comfortable to wear • Feel softer - comfort/luxury appearance / feel • More opaque - improves appearance • Insulation - makes them warmer to wear • Handle - easier to work with / feel better / drape better or hold their shape better • Imitate other fabrics such as fur / add warmth / texture /water repellent • Increases strength / makes more hardwearing • Increase surface area - increases absorbency / insulation • adds visual texture - makes them more interesting to look at / different textured fabrics can be combined to create an effect	**8** If candidate does not provide an analytical/evaluative response, then only L1 can be awarded.	**Level 3 [6-8 marks]** The candidate has a clear understanding of how fancy yarns can enhance the functional performance and aesthetics of fashion and textile products. They produce a thorough discussion in relation to the question by discussing how fancy yarns can enhance existing products. The discussion is clear with relevant examples evident and in context. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated with the use*

			• Adds texture to make them feel interesting / adds variety • Can imitate natural fibres - can make products easier to care for and more hardwearing • Can make a lightweight fabric appear more expensive / luxurious • Metallic threads can be introduced for sparkle / added appeal / texture Candidates should link these characteristics to specific fancy yarns and products. Examples include: • **Texture** - Texture can be achieved in the construction of the yarn, for example to add a loop (Bouclé). Thermoplastic synthetic filament yarns can be heat processed to create Crimps, coils and loops can also be created in the yarn. This adds bulk to the yarn to make it warmer, more elastic and absorbent and gives a softer feel. (Bouclé and Lurex). This makes the yarn suitable for knitwear, sweaters, bathrobes etc. • **Textured yarn** is made from thermoplastic synthetic filament yarn such as polyester or nylon. The texturing is achieved by a heat process which makes the yarns opaquer, improves appearance and texture and increases warmth and absorbency. These changes affect the physical form of a fibre's behaviour and handle of fabrics made from them. Textured yarns are used for making hosiery, knitted underwear, and outerwear and shape-retaining knitted fabrics for suits and overcoats. They are also used in the production of artificial fur, carpets, blankets, drapery and upholstery fabrics. • **Bouclé** - A slub yarn is a spun yarn (ring or rotor-spun yarn) in which thickness variations are deliberately induced by variation in the yarn twist combined with control of the fibre feed, so that thick areas will exhibit lower twist than thin areas. Key structural factors associated with slub yarns include slub size with respect to yarn diameter, slub length and slub spacing or		*of examples.* **Level 2 [3-5 marks]** The candidate has a reasonable understanding of how fancy yarns can enhance the functional performance and/or aesthetics of fashion and textile products. They produce a sound discussion in relation to the question by explaining how fancy yarns can enhance existing products. The explanation is sufficient, with some examples evident and in context. *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 how fancy yarns can enhance the functional performance and/or aesthetics of fashion and textile products. Any reference to fancy yarns is limited and has little appreciation of product enhancement. The response contains no analysis or evaluation, with few or no relevant examples. *The information has some*

			frequency. Slubs are randomly and irregularly spaced along the yarn axis. This type of yarn provides a unique surface texture to the fabric making them particularly suitable for ladies and children's clothing and luxury upholstery. Bouclé yarns are found in both woven and knit fabrics. Loop or Bouclé yarns are frequently used in coating and suiting fabrics, for interior furnishings and for speciality fabrics, either knit or woven, due to their functional characteristics and appearance. interesting visual texture and super-soft comfort. • **Bulked effects** to enhance performance characteristics. For example, blending different staple fibres like acrylic and cotton to give an inexpensive yarn that is warm, lightweight, easy care and soft to handle. Bulked yarns are produced by taking staple fibres and making them thicker, bulkier and softer by applying water or heat. Acrylic/cotton fibres can be bulked up using heat to shrink the acrylic fibre and fluff up the cotton. The resulting yarn is warmer and soft to handle which makes it particularly suitable for knitwear. Acrylic and cotton combination gives an inexpensive yarn that is lightweight, easy-care, soft and warm, suitable for knitwear. • **Colour/lustre effects** – through the mixing of different yarns, for example, mixing with lurex to add sparkle, texture and to enhance appearance. • **Abraded yarns** – the surfaces of these yarns are cut or roughened (physical destruction) at various intervals and given an added twist to strengthen, producing a hairy effect. Bulk is introduced by crimping to give waviness and curling to produce loops or curls at intervals. This enhances strength, thermal properties, appearance and further abrasion resistance. • Any other suitable response.		*relevance and is presented with limited structure or detail. The information is supported by limited evidence.* **0 marks** No answer or answer not worthy of credit.

4	**(a)**		Possible reasons may include: • Stress cracking resistant (1). • Abrasion resistant (1). • Durable (1). • Provides cushioning (1). • Thermal resistant (1). • Has excellent elasticity (1). • Pliable (1). • Ageing resistant (1). • Anti-slip (1). • Waterproof (1). • Any other suitable response.	**2**	In each case: One mark for identifying a reason why synthetic rubber is suitable for the sports shoes. Do not accept recyclable, non-irritant (does not irritate the skin)
4	**(b)**		Possible factors may include: • Considering the recyclability of the materials to be used for the sports shoe (1) as it will minimise the range of materials (1) • Looking at the materials and components in relation to manufacture. (1). For example, looking at ease to disassemble/dismantle the product for quicker/easier recycling (1). • Using materials that include high levels of recycled content (1) as it will minimise waste (1). • Buying materials/components locally where possible (1) to avoid CO 2 emissions (1). • Using biodegradable packaging (1) which reduces the impact of the packaging on the environment at the end of its life (1). • Making products that are designed so that more can be transported in one shipment (1) to avoid CO 2 emissions (1). • Designing products/packaging to interlock or stack in a different way (1) to reduce overall volume and decrease the storage and transport space (1). • Ensuring there is limited or no planned obsolescence (1) e.g., swapping of parts (circular economy) to reduce impact on	**6**	In each case: One mark for identifying a factor that the designer of the sports shoes needs to take into account to minimise environmental impact. One mark for justifying the factor that is given. Specific reference to the context in the question is needed for marks to be awarded.

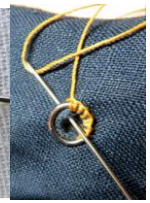
			environment (1). • Designing products to be more energy efficient (1) to avoid CO 2 emissions (1). • Design to avoid 'throwaway' fashion (1) – design footwear to stand the test of time and use durable and sustainably sound materials (1). • Any other suitable response.		
4	**(c)**	**(i)**	Possible reasons may include: • Decorative feature on the front of the sports shoe (1) makes sports shoe more appealing for wearer/trend setting (1). • Eyelets allow laces to slide better (1) making fastening easier (1). • Ties with eyelets can be adjusted (1) to fit any width to get a comfortable fit (1). • Iron and brass eyelets are colourful/fashionable (1) and enhance the appearance for the wearer (1). • Eyelets make the holes through which ties are passed sturdier (1) thus avoiding hole deformation or fraying (1). • Laces can be replaced (1) when the wear out / break / or to create a different effect / colour • Decoration can be added to the laces, such as beads (1) to change the appearance / create an effect (1). • Any other suitable response.	**2**	One mark for identifying a reason why eyelets and tie fastenings are a useful feature for the wearer. One mark for explaining why these features of the products are a useful feature. Specific reference to the context in the question is needed for marks to be awarded.
4	**(c)**	**(ii)**	***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.*** **Indicative Content:**	**6** All processes demonstrated must relate to eyelets. If candidate does not provide an	**Level 3 [5-6 marks]** The candidate demonstrates a good level of detail of the process needed to insert eyelets into fabric using technical terms and considering any relevant equipment, machinery and materials. Sketches, if used will

			Indicative Content: Grommets and eyelets are reinforced holes within a product (shoe/garment) for lacing. The larger holes, known as grommets, are made by cutting a slit in the fabric, then attaching metal or plastic rings on both sides of the slit. Some grommets require a setting tool or press to apply.  Create a hole • mark the position of the hole • reinforce thin, light, or stretchy fabric with interfacing • the size is determined by the size of the eyelet - it should fit snugly. Start small and gradually increase • cut the hole using eyelet pliers / awl / punch / scissors - protect the surface you are working on and work from the right side of the fabric.   Inset the eyelet • push the eyelet through from the right side so the flat side of the eyelet is on the right side • use eyelet pliers to bend the reverse side of the eyelet into place on the wrong side of the fabric. • some eyelets come in two parts, top eyelet for the right side of the fabric, and a backing for the reverse of the fabric. They are lined up in place on the fabric and hit with a hammer to join them together / pliers used	analytical/evaluative response, then only L1 can be awarded.	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 insert eyelets into fabric and there will be some consideration of any equipment, machinery and materials required. 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 insert eyelets into fabric with a limited use of technical terms and there will be a basic consideration of any equipment, machinery and materials required. 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.

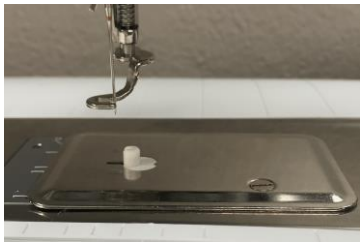


- Eyelets can be hand stitched by working a running stitch around the hole, then going round with a blanket or buttonhole stitch. Alternatively, a metal ring can be used to strengthen the fabric.



- Eyelets can be machine stitched using special attachments. Choose the correct size for the eyelet and attach to the machine. An eyelet foot is needed, and the feed dogs are lowered. The fabric is secured in an embroidery ring, and a zig zag stitch is worked over the raw edge of the hole. The fabric is rotated to achieve the circle of stitching. Some electronic machines will stitch eyelets automatically, and in this case, the hole is made after the stitching has been completed.




- Any other valid suggestion.

<table>
<tr>
<td>4</td>
<td>(d)
(i)</td>
<td>
<table>
<tr><th></th><th>Sales 2021</th><th>Sales 2022</th></tr>
<tr><td>Minimum value</td><td>70</td><td>60</td></tr>
<tr><td>Q1: 1st quartile</td><td>76</td><td>68</td></tr>
<tr><td>Median</td><td>78</td><td>77</td></tr>
<tr><td>Q3: 3rd quartile</td><td>86</td><td>86</td></tr>
<tr><td>Maximum value</td><td>90</td><td>95</td></tr>
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</td>
<td>1</td>
<td>Award one mark as follows:

One mark for calculating Q1 and Q2 for 2022.</td>
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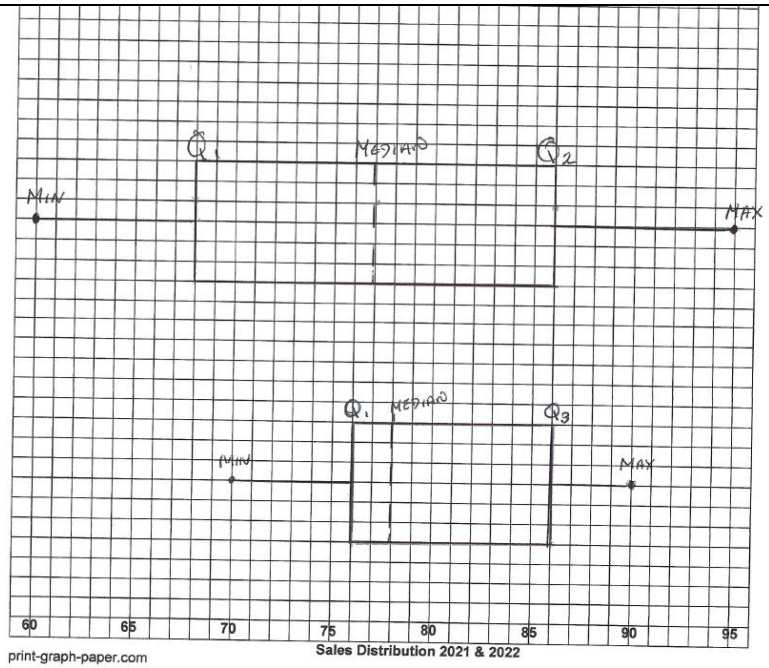
<td>(d)
(ii)</td>
<td> 
</td>
<td>2</td>
<td>Award two marks as follows:

One mark for plotting Box Plot for 2022.

One mark for correct labelling of box plot.

Note:

Follow through permitted:

Award mark for correct drawing of Box Plot based on figures they calculated for Q1 and Q3 even if these were not accurate.

Award 1 mark for correct labelling of Box Plot even if it has not been plotted correctly.</td>
</tr>
</table>

4	**(e)**		Possible reasons may include: • Lean manufacturing offers the manufacturer the opportunity to **streamline production systems (1)…** to deliver at speed (1) to reduce costs (1) to eliminate waste and increase productivity (1) to maintain high levels of quality and still make a profit (1) • **Lean manufacturing can increase profit** (1) as the customer defines what is of value in terms of what they would pay for the product (1). • **Lean manufacturing can reduce costs** (1) as money is saved when a company is not wasting time, materials and personnel or unnecessary activities (1). • **Lean manufacturing can improve processes through continuous improvement/knowledge** (1) which can result in getting the right things to the right place at the right time, in the right quantity (1). • **Lean manufacturing can increase product quality** (1) as improved efficiency frees up employees and resources for innovation and quality control that would have previously been wasted (1). • **Lean manufacturing can eliminate waste** (1) which can impact costs, deadlines and resources. • **Lean manufacturing can reduce time** (1) as by reducing the time it takes to start and finish a project this creates value by adding efficiencies (1). • Any other suitable response.	**4**	In each case: One mark for identifying a reason why lean manufacturing is beneficial to the manufacturer of the synthetic sports shoes. One mark for explaining the reason given. Specific reference to the context in the question is needed for marks to be awarded. Mix and match approach to be taken with bullet points.

4	**(f)**		Possible ways may include: • Repair (1). • Revamp (1). • Community shoe swap (1). • Donate to a charity (1) • Programme for re-purposing or donations (1). • Apply an iron - on decoration (1). • Stitch fabric shapes onto the shoe (1). • Embroider a design onto the shoe - hand or machine (1). • Glue buttons / sequins / beads etc on to create a design (1). • Decorate with acrylic paint / markers (1). • Add glitter/fluorescent designs (1). • Dye the existing fabric a different colour - all of it or just parts (1). • Spray paint a design onto the shoe (1). • Cut out sections to create a sandal type of footwear (1). • Be creative with the laces / change how they fasten (1). • Deconstruct the shoe and use the component parts for other projects (1). • Add ribbon/lace (1). • Decoupage (1). • Any other suitable response.	**3**	In each case: One mark for identifying a way the consumer could up-cycle the synthetic rubber sports shoes. Specific reference to the context in the question is needed for marks to be awarded.

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