OCR
Oxford Cambridge and RSA

Thursday 9 June 2022 – Afternoon

A Level in Design and Technology: Fashion and Textiles

H405/01 Principles of Fashion and Textiles

Time allowed: 1 hour 30 minutes

8949241550

You can use:
- a ruler (cm/mm)
- a scientific calculator
- geometrical instruments

H405/01

Please write clearly in black ink. **Do not write in the barcodes.**

Centre number | | | | | | Candidate number | | | | |

First name(s) _____

Last name _____

INSTRUCTIONS
- Use black ink. You can use an HB pencil, but only for graphs and diagrams.
- Write your answer to each question in the space provided. You can use extra paper if you need to, but you must clearly show your candidate number, the centre number and the question numbers.
- Answer **all** the questions.
- Where appropriate, your answer should be supported with working. Marks might be given for using a correct method, even if your answer is wrong.

INFORMATION
- The total mark for this paper is **80**.
- The marks for each question are shown in brackets **[ ]**.
- Quality of extended response will be assessed in questions marked with an asterisk (*).
- This document has **20** pages.

ADVICE
- Read each question carefully before you start your answer.

Answer **all** the questions.

1 **Fig. 1.1** shows a pair of foot protectors which includes a separate left and right foot. The foot protectors are made for individuals with physical disabilities, reduced motor skills or for recovering after surgery.

Fig. 1.1

(a) The outer layer of the foot protectors is made from a polyester-cotton fabric.

State **two** advantages of blending polyester fibres with cotton fibres for the fabric of the foot protectors.

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2 .....

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[2]

(b) The inner lining of the foot protectors has been made from a weft knitted fleece fabric.

Explain **two** reasons why a weft knitted fleece fabric would be suitable for the inner lining of the foot protectors.

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[4]

(c) The position of each of the velcro fastenings on the foot protectors is transferred accurately from the pattern piece to the fabric using tailor tacks.

Use annotated sketches and/or notes to show how to work a tailor's tack.

Include any relevant equipment and materials. **[6]**

(d) Identify **one** design feature which increases the functionality of the foot protectors for the user.

Justify your answer.

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(e) Explain **three** factors that the designer of the foot protectors needs to consider when selecting materials during the product development stage.

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[6]

(f) Product assurance is an important consideration for manufacturers who have responsibility for customer safety.

Explain **three** ways that health and safety legislation and/or relevant standards could be used to attract or assure customers when choosing a product such as the foot protectors.

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[6]

2 A small business makes patchwork quilts for a variety of bed sizes.

Fig. 2.1 shows the design of a patchwork quilt.

Fig. 2.2 shows one of the regular hexagon templates in the patchwork quilt.

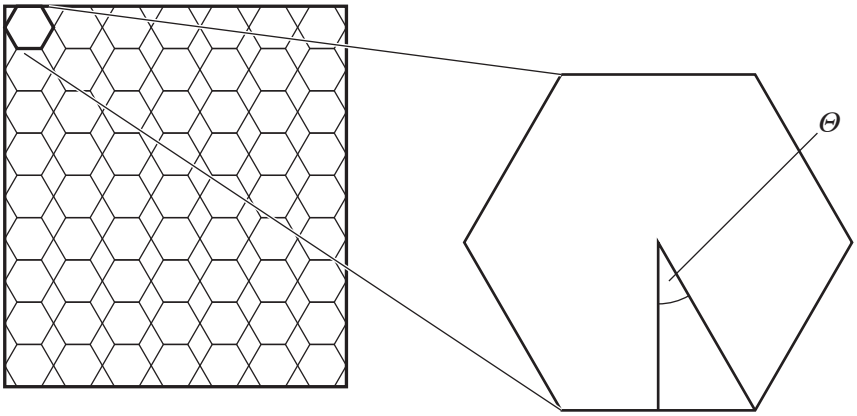

Fig. 2.1 **Fig. 2.2**

(a) (i) Calculate angle Θ. Show your working. **[2]**

Θ ..... °

Fig. 2.3 shows the hexagon and length AC.

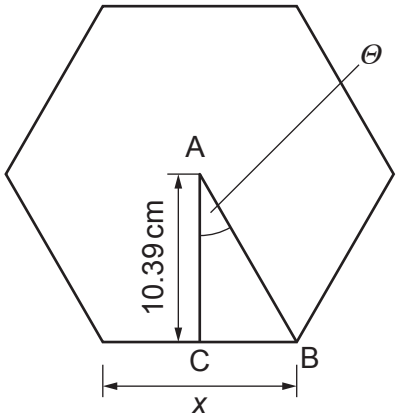

Fig. 2.3
(not to scale)

(ii) Use your answer from **part (a) (i)** and **Fig. 2.3** to calculate the length of side *x* of the hexagon. Give your answer in cm to **0** decimal places and show your working. **[3]**

x ..... cm

(b) A series of triangles are used to infill the hexagons at the edge of the fabric shown in **Fig. 2.1**.

Use the grid **on the page opposite** and the following co-ordinates to draw the template for the right-angled and isosceles triangles. Label the co-ordinates for each point.

Right-angled triangle: (0,0), (5,0), (0,12)

Isosceles triangle: (7,0), (12,12), (7,24) **[3]**

(c) The designer of the quilt wants to sew smaller hexagons onto the larger hexagons in a different colour and style of fabric to enhance the basic design.

Fig. 2.4 shows the diameter of the smaller hexagon.

Use the 1-cm grid below to draw the template for the smaller hexagon. **[1]**

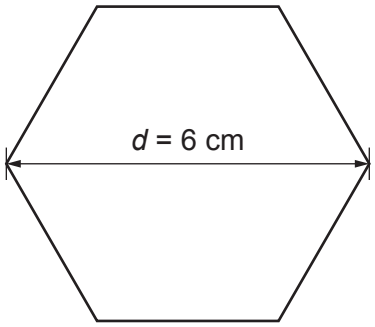

Fig. 2.4
(not to scale)

(d) The quilt is made in four sizes. The four sizes are single, double, king and super-king.

Fig. 2.5 shows the sales of all sizes of quilt in April 2021.

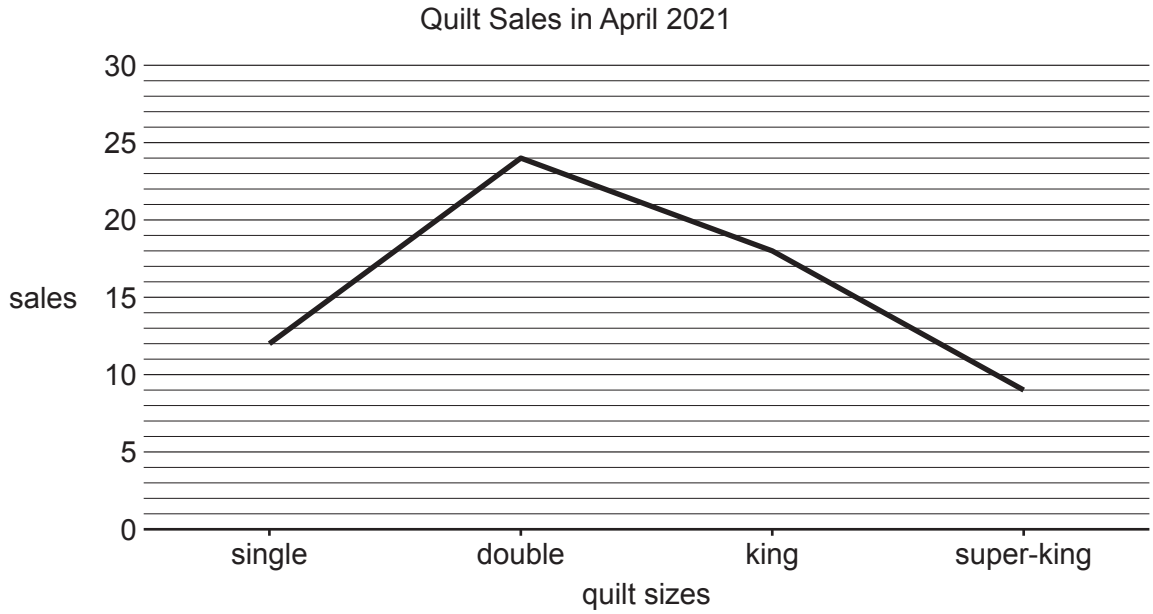

Fig. 2.5

(i) Identify the modal value of the sales.

..... **[1]**

(ii) Identify the frequency of the king quilt.

..... **[1]**

(iii) Each of the quilt sizes come with a choice of wadding fibres. The three choices of wadding are cotton fibres, polyester fibres or wool fibres.

Calculate the probability of a customer buying a super-king quilt with polyester wadding. Show your working. **[3]**

Probability .....

(e) A pre-production prototype of the quilt is used by the manufacturer to test functional feasibility.

Identify **one** way physical testing systems are integrated into the manufacturing process of products such as the quilt to test functional feasibility.

Justify your answer.

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..... **[3]**

3 Natural mineral textiles such as glass fibre are often used in construction applications.

Fig. 3.1 shows a building which incorporates a textile skin made from a glass fibre.

Fig. 3.1

(a) The glass fibre textile skin for the construction of the building is to be manufactured using a fully automated manufacturing system.

Explain **two** benefits to the manufacturer of using this type of production method.

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[4]

(b)* Discuss how the addition of natural mineral fibres such as glass, carbon and ceramic can enhance materials and components for industrial use.

Use examples to support your answer.

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4 **Fig. 4.1** shows a pair of denim jeans which has been biologically finished through the use of natural enzymes to create a stonewash effect.

Fig. 4.1

(a) Explain **one** environmental benefit of using natural enzymes to create the stonewash effect on the denim jeans.

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..... **[2]**

(b) State **two** benefits of using biological techniques, such as natural enzymes, to enhance the aesthetic qualities of textile products such as the denim jeans.

Justify **each** of your answers.

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[4]

(c) Denim is made from 100% cotton fibres.

Give **two** reasons why cotton fibres are suitable for the denim jeans.

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[2]

(d) **(i)** The denim jeans has an elasticated waist.

Explain **one** reason why this is a useful feature for the wearer.

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(ii) Use annotated sketches and/or notes to show how to work an elasticated waistband on a textile product such as a pair of denim jeans.

Include any relevant equipment, machinery and materials. **[6]**

(e) **Fig. 4.2** indicates the waist measurements for different United Kingdom (UK) women's sizes.

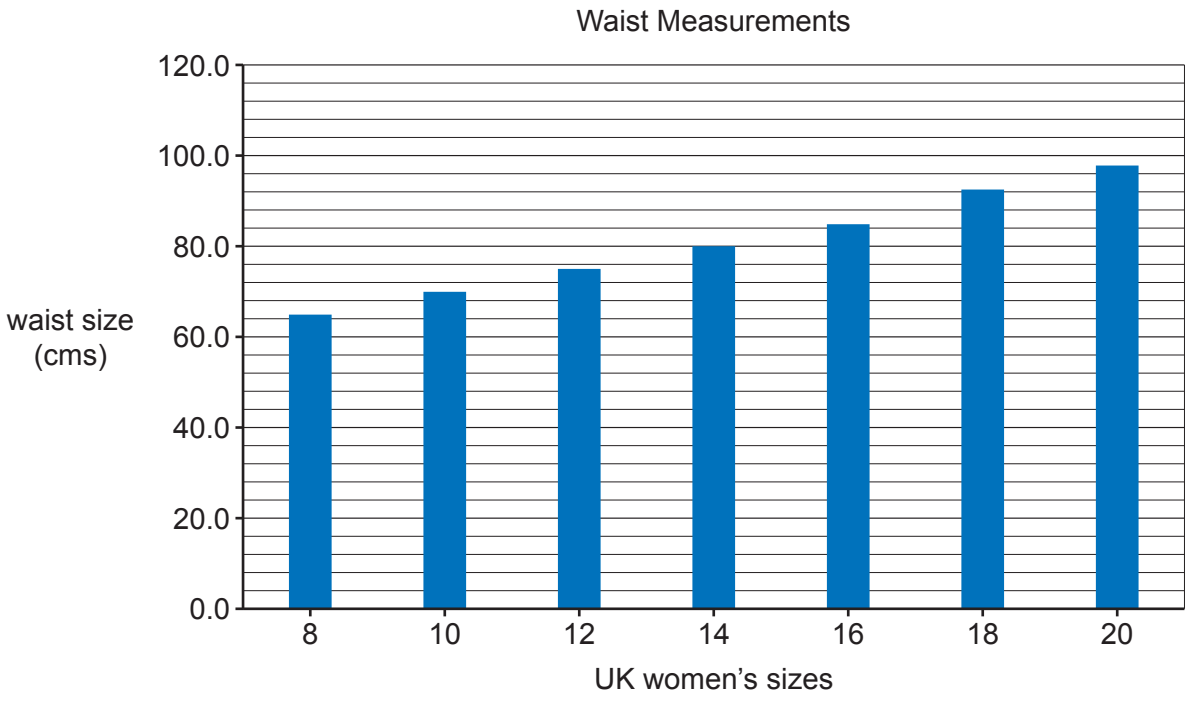

Fig. 4.2

The length of elastic required is 84% of the actual waist size.

A 2.5 cm overlap is required to stitch the ends of the elastic together.

Calculate the final length of the elastic for the waistband of a pair of size 14, stonewashed denim jeans after they have been stitched. Give your answer in cm to the nearest whole number. Show your working. **[3]**

Length of elastic ..... cm

(f) The manufacturer of the denim jeans wants to expand its range to include luxury embellishments.

Discuss the impact the addition of this form of embellishment would have on **both** the manufacturer and the consumer.

Use examples to support your answer.

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END OF QUESTION PAPER

PLEASE DO NOT WRITE ON THIS PAGE