

Design and Technology
COMPONENT 1: Textiles

Total Marks

Time: 1 hour 45 minutes

In the boxes below, write your name, centre number and candidate number.

Surname					
Other names					
Centre Number					
Candidate Number					

YOU MUST HAVE

Calculator, ruler, writing and drawing equipment, protractor, compass

YOU WILL BE GIVEN

Diagram Booklet

INSTRUCTIONS

Answer ALL questions.

Answer the questions in the spaces provided in this Question Paper or in the separate Diagram Booklet – there may be more space than you need.

Calculators may be used.

Any diagrams may NOT be accurately drawn, unless otherwise indicated.

You must show all your working out with your answer clearly identified at the end of your solution.

Turn over

INFORMATION

The total mark for this paper is 100.

The marks for EACH question are shown in brackets – use this as a guide as to how much time to spend on each question.

There may be spare copies of some diagrams.

ADVICE

Read each question carefully before you start to answer it.

Try to answer every question.

Check your answers if you have time at the end.

SECTION A

Core

Answer ALL questions. Write your answers in the spaces provided.

- 1 (a) The materials that products are made from are chosen because of their properties.**

Look at FIGURE 1 for Question 1(a) in the Diagram Booklet. It shows a table of products.

For each of the products shown, give a property of the material it is made from that makes the material suitable for the product.

The first one has been done for you.

(continued on the next page)

1 continued.

(b) Explain ONE disadvantage of using urea formaldehyde for the 3-pin plug. (2 marks)

(continued on the next page)

1 continued.

The pins of the 3-pin plug are made from brass.

**Brass is an alloy of copper and zinc in the ratio of 13:7
(13 parts copper to 7 parts zinc).**

**(c) On this page and page 7 calculate how much copper is required to make 50 kg of brass.
(2 marks)**

(continued on the next page)

Turn over

1 continued.

Answer _____ kg

(Total for Question 1 = 8 marks)

Turn over

2 Look at FIGURE 2 for Question 2 in the Diagram Booklet. It shows a wall mounted book holder manufactured from mahogany.

**(a) Name ONE other appropriate hardwood that could be used to make the wall mounted book holder.
(1 mark)**

**(b) Explain ONE working property of mahogany that makes it an appropriate choice of material for the wall mounted book holder.
(2 marks)**

(continued on the next page)

Turn over

2 continued.

Each wall mounted book holder is made as a one-off.

**(c) Explain ONE advantage for the manufacturer of making each wall mounted book holder as a one-off.
(2 marks)**

(continued on the next page)

Turn over

2 continued.

Look at FIGURE 3 for Question 2(d) in the Diagram Booklet. It shows the sizes of two pieces of mahogany used to make the wall mounted book holder.

The mahogany has a cross sectional area of 5 cm^2

(continued on the next page)

2 continued.

- (d) Calculate the cost of the mahogany required to make one wall mounted book holder if the mahogany costs £1,200 m³.
(4 marks)**

Cost £ _____

(Total for Question 2 = 9 marks)

Turn over

3 Look at FIGURE 4 for Question 3 in the Diagram Booklet. It shows an electrically powered hand drill and the circuit symbol for an electrical component.

**(a) Name the type of electrical component from the circuit symbol shown in the figure.
(1 mark)**

(continued on the next page)

3 continued.

The electrically powered hand drill is being redesigned. The manufacturer is considering using a bevel gear inside.

**(b) Explain ONE reason for using a bevel gear inside the electrically powered hand drill.
(2 marks)**

(continued on the next page)

3 continued.

- (c) The electrically powered hand drill also has a compound gear train inside.**

Look at FIGURE 5 for Question 3(c) in the Diagram Booklet. It shows a schematic diagram of the compound gear train.

**On this page and page 15 calculate the revolutions per minute (RPM) of the driven gear if the driver gear rotates at 400 RPM.
(2 marks)**

(continued on the next page)

Turn over

3 continued.

Driven gear _____ RPM

(continued on the next page)

3 continued.

**(d) Explain ONE benefit of using a battery for the electrically powered hand drill.
(2 marks)**

(continued on the next page)

3 continued.

The manufacturer of the electrically powered hand drill is considering using carbon fibre for the main body.

**(e) Explain TWO benefits of using carbon fibre for the main body of the electrically powered hand drill.
(4 marks)**

1 _____

2 _____

(continued on the next page)

Turn over

3 continued.

(Total for Question 3 = 11 marks)

4 A not-for-profit organisation has developed some agro-textiles that can be used by farmers.

**(a) Explain TWO ways that agro-textiles can be used by farmers.
(4 marks)**

1 _____

2 _____

(continued on the next page)

Turn over

4 continued.

(b) A farmer requires 420 m^2 of agro-textile to cover their field.

The agro-textile is available in rolls 50 m long measuring 1.2 m wide.

**On this page and page 21 calculate the number of rolls of agro-textile the farmer needs to cover their field.
(2 marks)**

(continued on the next page)

Turn over

4 continued.

Number of rolls _____
(continued on the next page)

Turn over

4 continued.

**(c) Discuss how fair trade products have been used to support farmers and societies in developing countries.
(6 marks)**

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4 continued.

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4 continued.

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4 continued.

(Total for Question 4 = 12 marks)

TOTAL FOR SECTION A = 40 MARKS

SECTION B

Textiles

Answer ALL questions. Write your answers in the spaces provided.

5 Look at FIGURE 6 for Question 5 in the Diagram Booklet. It shows a design solution for a child's fabric height chart together with some additional information.

(a) The child's fabric height chart needs to be improved to include the following specification points.

The fabric height chart must:

- be easy to keep clean and include a method that allows a child's height to be recorded as they grow**
- be able to be personalised for a child and include a method that allows the height of an average nine year old to be measured**
- be able to be hung up from a door and be easily moved to another location.**

(continued on the next page)

5 continued.

Look at the outline for Question 5(a) in the Diagram Booklet.

Use notes and sketches, on the outline, to show how the fabric height chart could be modified to include these three specification points.

**You will be marked on how you apply your understanding of design and technology, not your graphical skills.
(6 marks)**

(continued on the next page)

5 continued.

(b) Look at FIGURE 7 for Question 5(b) in the Diagram Booklet. It shows a fabric covered soft foam money box in the shape of a tea cup.

**Explain TWO ways that the fabric covered soft foam money box meets, or fails to meet, the criteria of providing a method to encourage young children to save money.
(4 marks)**

1 _____

(continued on the next page)

Turn over

5 continued.

2 _____

(Total for Question 5 = 10 marks)

- 6 Look at FIGURE 8 for Question 6 in the Diagram Booklet. It shows a pleated skirt manufactured from a woven polyester fabric.**

The skirt pieces are manufactured from a standard sized width of fabric.

- (a) Explain TWO advantages for the manufacturer of using a standard sized width of fabric for the skirt pieces.
(4 marks)**

1 _____

(continued on the next page)

Turn over

6 continued.

2 _____

(continued on the next page)

6 continued.

(b) The skirt is pleated from the waistband.

Use notes and sketches, in the spaces below and on page 35, to show how to form a pleat.

**You will be marked on how you apply your understanding of design and technology, not your graphical skills.
(4 marks)**

6 continued.

(continued on the next page)

Turn over

6 continued.

The skirt pleats are heat-set.

**(c) Explain ONE reason for heat-setting the pleats.
(2 marks)**

(continued on the next page)

6 continued.

(d) Give TWO different methods of finishing the raw edge at the bottom of the skirt.

**For each method, explain ONE advantage of using that method to finish the raw edge at the bottom of the skirt.
(6 marks)**

Method 1

Explanation

(continued on the next page)

Turn over

6 continued.

Method 2

Explanation

(Total for Question 6 = 16 marks)

Turn over

7 Look at FIGURE 9 for Question 7 in the Diagram Booklet. It shows a fancy dress costume.

**(a) State the type of force the elasticated hat strap is subjected to when stretched around the chin.
(1 mark)**

**(b) Explain TWO properties of nylon that make it an ideal fibre for the fancy dress costume.
(4 marks)**

1

(continued on the next page)

Turn over

7 continued.

2

Look at FIGURE 10 for Question 7(c) in the Diagram Booklet. It shows a dimensioned drawing of one of the foam padded decorative details on the fancy dress jacket.

The foam padding is 4 mm thick.

(continued on the next page)

Turn over

7 continued.

(c) On this page and page 43 calculate the volume of material needed to produce one of the foam padded decorative details.

Give your answer to the nearest whole cm^3 .

**Use $\pi = 3.142$
(5 marks)**

(continued on the next page)

Turn over

7 continued.

Answer _____ cm³

(continued on the next page)

Turn over

7 continued.

The different parts of the fancy dress costume are cut out from separate pieces of blue nylon rather than from a single roll.

**(d) Explain TWO reasons for cutting the different parts of the fancy dress costume from separate pieces of blue nylon rather than from a single roll.
(6 marks)**

1 _____

(continued on the next page)

Turn over

7 continued.

2

(Total for Question 7 = 16 marks)

Turn over

- 8 Look at FIGURE 11 for Question 8 in the Diagram Booklet. It shows a family picnic bag manufactured from a polyamide fabric.**

The family picnic bag is lined with an insulating reflective fabric.

- (a) Explain ONE benefit of manufacturing the family picnic bag from a polyamide fabric.
(2 marks)**

(continued on the next page)

8 continued.

The picnic bags are subjected to quality control checks during manufacture.

**(b) Explain ONE advantage of carrying out a quality control check on the family picnic bags during manufacture.
(3 marks)**

(continued on the next page)

8 continued.

**(c) Explain TWO reasons for using a laser cutter to cut out the pieces for the family picnic bags.
(4 marks)**

1 _____

2 _____

(continued on the next page)

Turn over

8 continued.

(continued on the next page)

8 continued.

(d) The family picnic bag is manufactured from polyamide fabric and is lined with an insulating reflective fabric.

Look at FIGURE 12 for Question 8(d) in the Diagram Booklet. It shows some additional information about the family picnic bag.

Analyse the information in Figure 12.

Evaluate the family picnic bag with reference to social and availability factors including:

- use for different social groups**
- use of stock materials**
- use of specialist materials.**

(9 marks)

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8 continued.

(Total for Question 8 = 18 marks)

TOTAL FOR SECTION B = 60 MARKS
TOTAL FOR PAPER = 100 MARKS
END OF PAPER

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