Pearson Edexcel Level 1/Level 2 GCSE (9–1)

Time 1 hour 45 minutes

Paper reference **1DT0/1E**

Design and Technology
COMPONENT 1: Textiles

You must have:
Calculator, ruler, HB pencil, protractor, compass

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *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**.

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*.

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.

Turn over ▶

SECTION A

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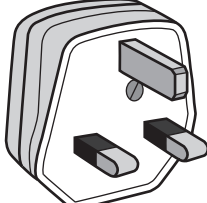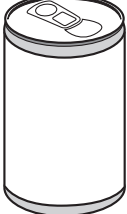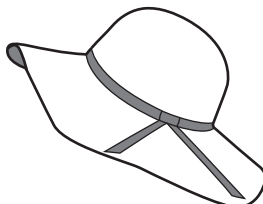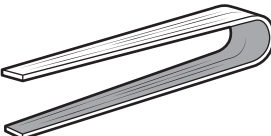
Answer ALL questions. Write your answers in the spaces provided.

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

Figure 1 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.

Picture of product	Material and product	Property
	Urea formaldehyde 3-pin plug	Insulator of electricity
	Aluminium drinks can	**(1)** (i) ....
	Felted wool fabric hat	**(1)** (ii) ....
	Tracing paper	**(1)** (iii) ....
	Laminated plywood salad servers	**(1)** (iv) ....

Figure 1

(b) Explain **one** disadvantage of using urea formaldehyde for the 3-pin plug.

(2)

....

....

....

....

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) Calculate how much copper is required to make 50 kg of brass.

(2)

Answer .... kg

(Total for Question 1 = 8 marks)

2 Figure 2 shows a wall mounted book holder manufactured from mahogany.

Book

DT

Wall mounted book holder

Screwed to the wall through the front of the book holder
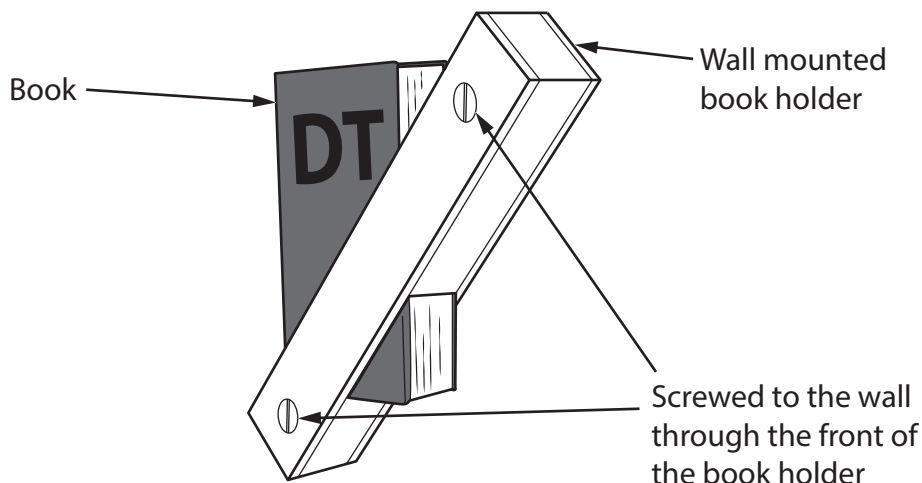
Figure 2

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

(1)

....

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

(2)

....

....

....

....

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)

....

....

....

....

....

P71343RA0428

Figure 3 shows the sizes of two pieces of mahogany used to make the wall mounted book holder.

2 required at this length

|← 30 →|

1 required at this length

|← 40 →|
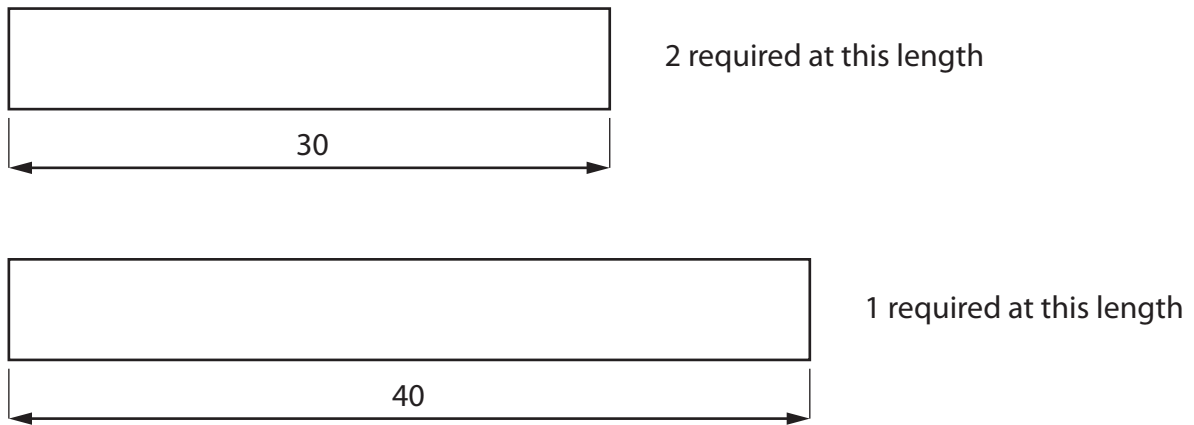
Figure 3

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

All dimensions in cm

Diagram not to scale

(d) Calculate the cost of the mahogany required to make one wall mounted book holder if the mahogany costs £1,200 m^3.

(4)

Cost £ ....

(Total for Question 2 = 9 marks)

P 7 1 3 4 3 R A 0 5 2 8

3 Figure 4 shows an electrically powered hand drill and the circuit symbol for an electrical component.

Chuck

Electrical component

Main body

Battery
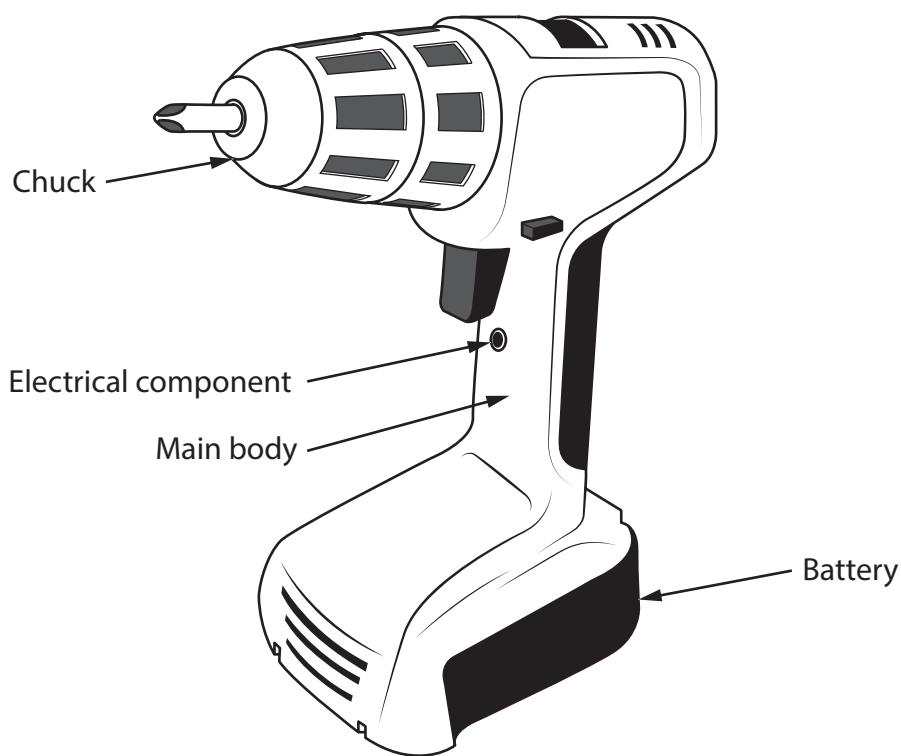
Circuit symbol for the electrical component

Figure 4

(a) Name the type of electrical component from the circuit symbol shown in Figure 4.

(1)

....

P71343RA0628

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)

....

....

....

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

Figure 5 shows a schematic diagram of the compound gear train.
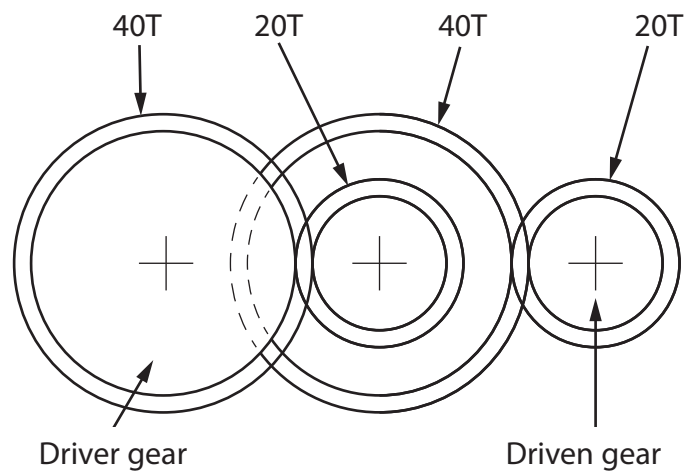
T = Teeth

Figure 5

Calculate the revolutions per minute (RPM) of the driven gear if the driver gear rotates at 400 RPM.

(2)

Driven gear .... RPM

Turn over ▶

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

(2)

....

....

....

....

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)

1 ....

....

....

....

2 ....

....

....

....

(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)

1 ....

....

....

....

2 ....

....

....

....

(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.

Calculate the number of rolls of agro-textile the farmer needs to cover their field.

(2)

Number of rolls ....

P 7 1 3 4 3 R A 0 9 2 8

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

(6)

....

....

....

....

....

....

....

....

....

....

....

**(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 Figure 6 shows a design solution for a child's fabric height chart together with some additional information.

120
110
100
90
80 — Fabric strip
70
60
50
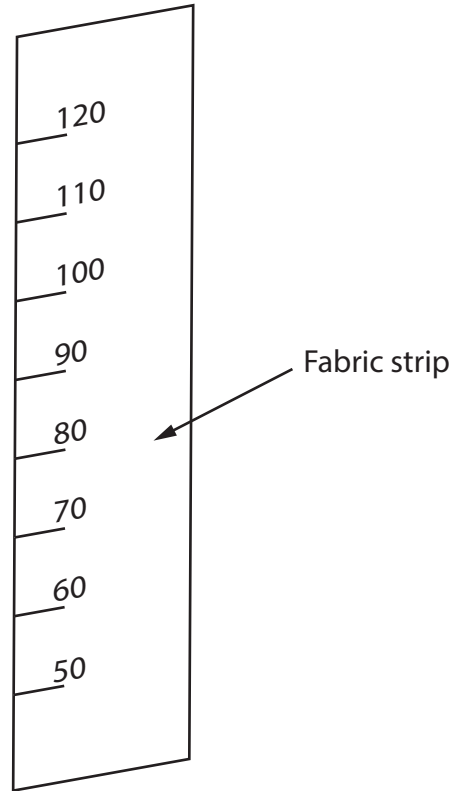
Additional information

Average height of a child:	
Six years old	116 cm
Seven years old	120 cm
Eight years old	128 cm
Nine years old	140 cm

Figure 6

(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.

Use notes and sketches, on the outline below, 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)

120

110

100

90

80

70

60

50
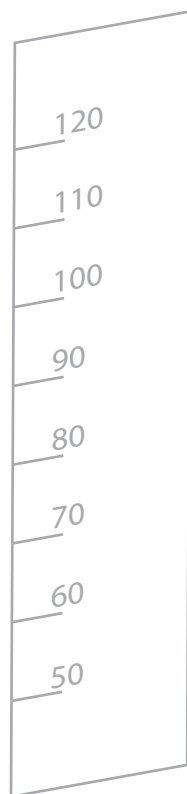
(b) Figure 7 shows a fabric covered soft foam money box in the shape of a tea cup.

Slot for coins

See-through screen
on both sides
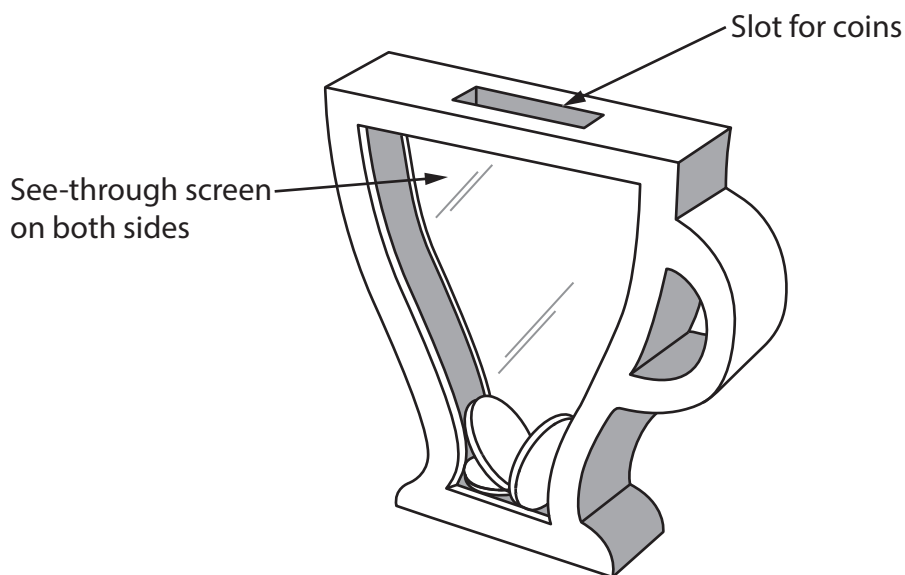
Figure 7

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)

1 ....

....

....

....

2 ....

....

....

....

(Total for Question 5 = 10 marks)

6 Figure 8 shows a pleated skirt manufactured from a woven polyester fabric.

Waistband

Pleated skirt

Pleats

Heat-set finish
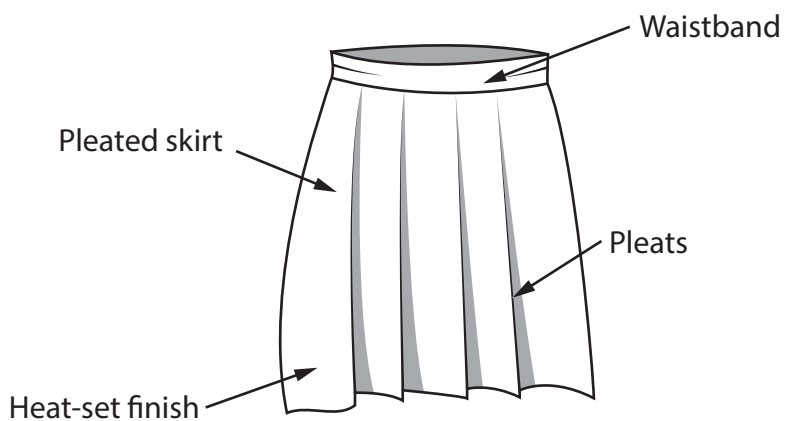
Figure 8

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)

1 ....

....

....

....

2 ....

....

....

....
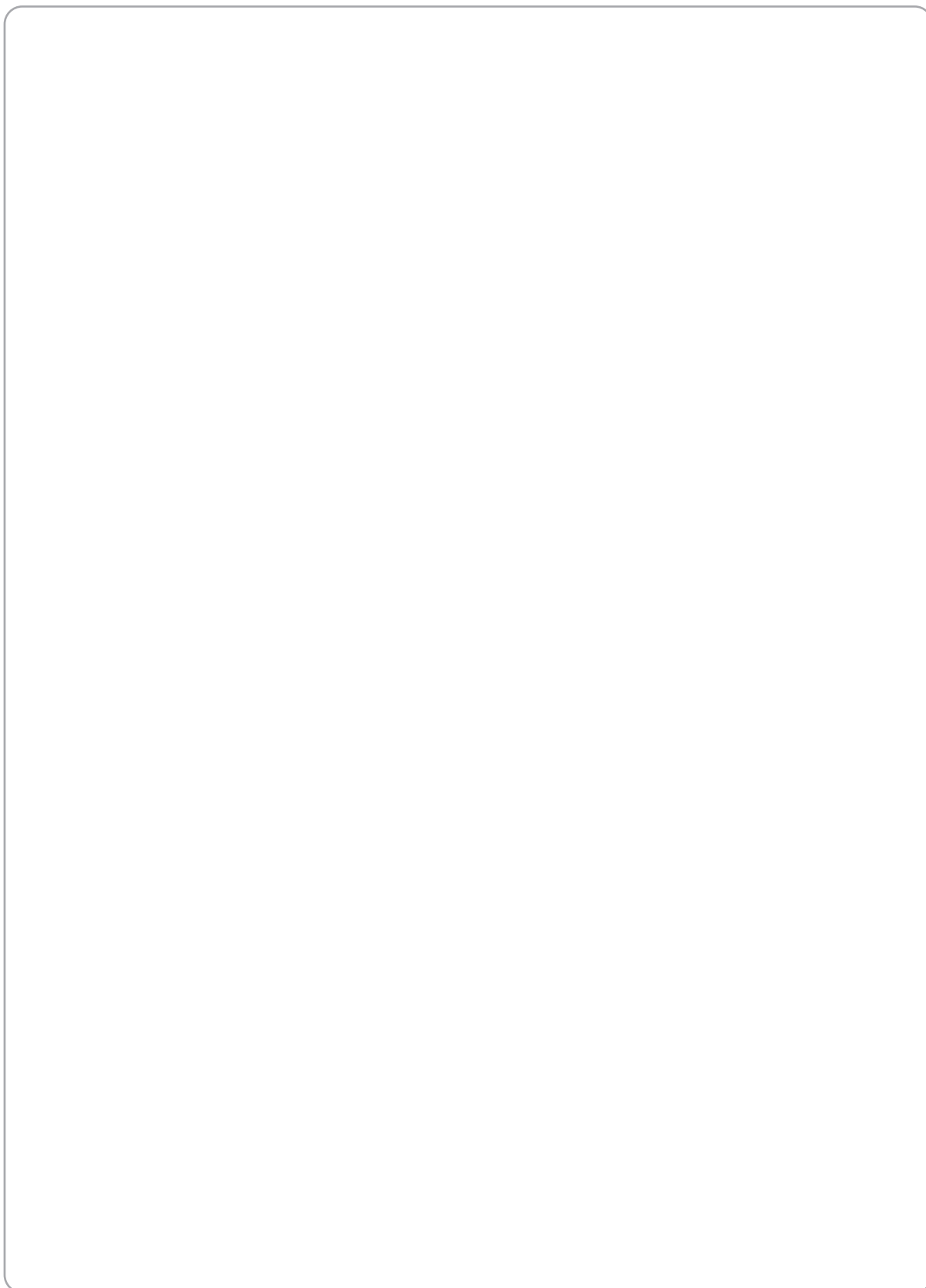
(b) The skirt is pleated from the waistband.

Use notes and sketches, in the space below, 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)

P 7 1 3 4 3 R A 0 1 6 2 8

The skirt pleats are heat-set.

(c) Explain **one** reason for heat-setting the pleats.

(2)

....

....

....

....

(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)

Method 1

....

Explanation

....

....

....

Method 2

....

Explanation

....

....

....

(Total for Question 6 = 16 marks)

7 Figure 9 shows a fancy dress costume.

Elasticated hat strap

Foam padded
decorative detail

Blue nylon fabric
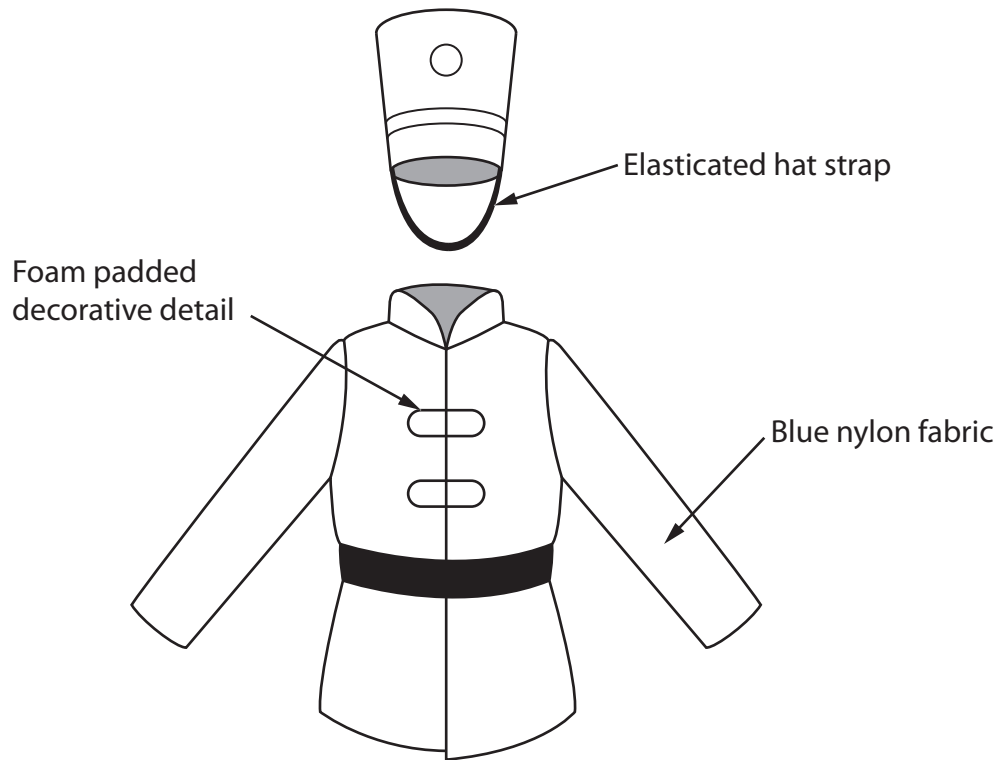
Figure 9

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

(1)

....

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

(4)

1 ....

....

....

2 ....

....

....

....

P 7 1 3 4 3 R A 0 1 9 2 8

Figure 10 shows a dimensioned drawing of one of the foam padded decorative details on the fancy dress jacket.

The foam padding is 4 mm thick.
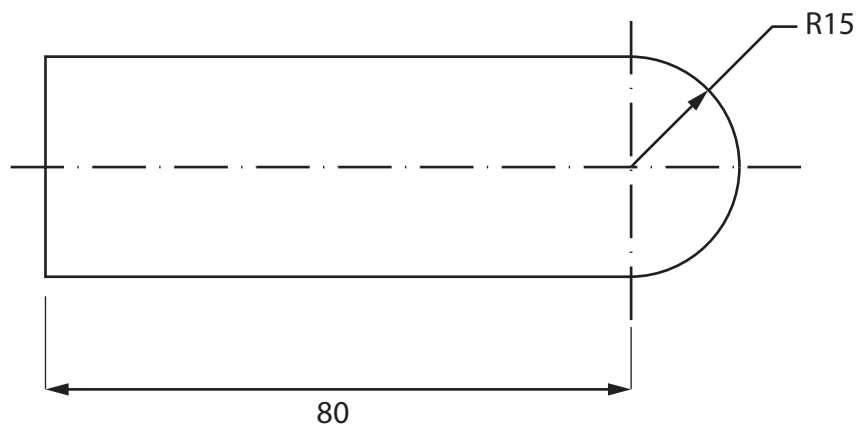
All dimensions are in mm

Diagram not to scale

Figure 10

(c) 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)

Answer .... cm^3

P 7 1 3 4 3 R A 0 2 1 2 8

Turn over ▶

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)

1 ....

....

....

....

....

....

2 ....

....

....

....

....

(Total for Question 7 = 16 marks)

8 Figure 11 shows a family picnic bag manufactured from a polyamide fabric.

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

Zip

250

Polyamide
fabric

300
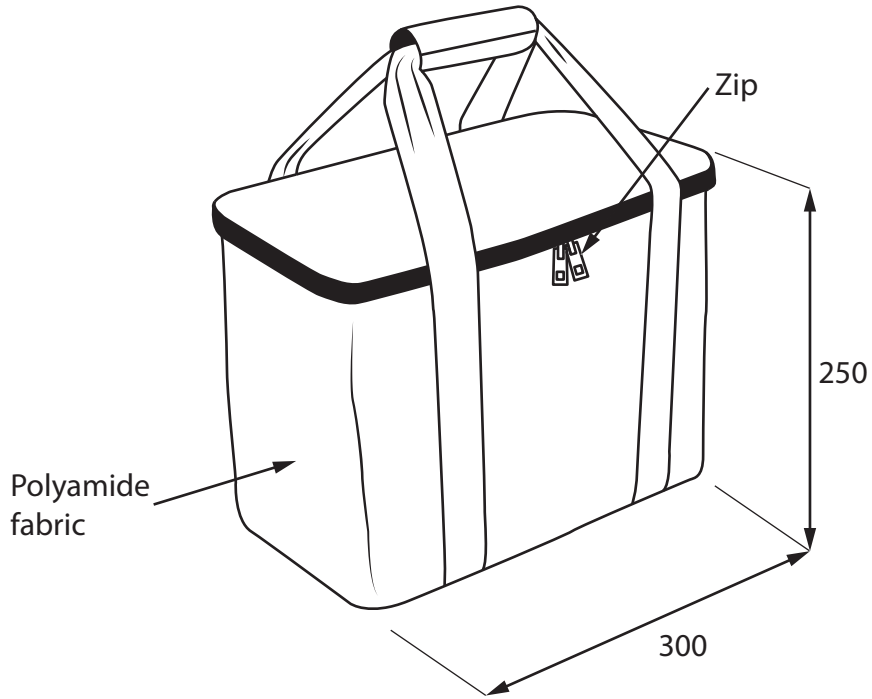
All dimensions in mm

Diagram not to scale

Figure 11

(a) Explain **one** benefit of manufacturing the family picnic bag from a
polyamide fabric.

(2)

....

....

....

....

P 7 1 3 4 3 R A 0 2 3 2 8

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)

....

....

....

....

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

(4)

1 ....

....

....

2 ....

....

....

....

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

Figure 12 shows some additional information about the family picnic bag.

Source of oil for polyamide fabric	Saudi Arabia / UAE
Picnic bag fabric	137 cm wide woven polyamide
Potential market	Families, walkers, day trippers
Scale of production	Batch

Figure 12

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)

....

....

....

....

....

....

....

....

....

....

....

....

....

(Total for Question 8 = 18 marks)

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

P71343RA02628

BLANK PAGE

BLANK PAGE

P71343RA02828
P 7 1 3 4 3 R A 0 2 8 2 8