

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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

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Friday 22 May 2020

Afternoon (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 ►

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Pearson

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.

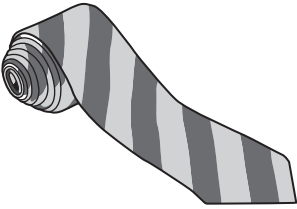

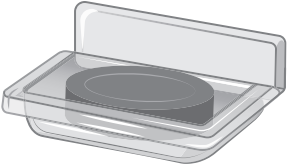

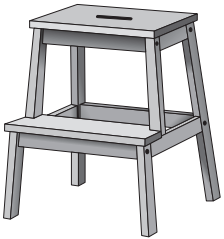
Picture of product	Material and product	Property
	Polyester school tie	Crease resistant
	Brass garden tap	(1) (i)
	Acrylic soap tray	(1) (ii)
	Folding box board breakfast cereal box	(1) (iii)
	Beech kitchen steps	(1) (iv)

Figure 1

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(b) The school tie is made from a piece of fabric measuring 135 cm long by 9 cm wide.

The fabric is supplied in a roll that is 90 mm wide and costs £3.55 per metre.

The fabric can be bought to the nearest cm.

Calculate the cost of fabric required to make one tie giving your answer in pounds (£) to 2 decimal places (dp).

(2)

Cost £

(c) An advantage of using polyester for the school tie is that it is crease resistant.

Explain **one** other advantage of using polyester for the school tie.

(2)

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(Total for Question 1 = 8 marks)



- 2 Figure 2 shows a bending jig that is used to make three separate, different-sized wire flowers for some jewellery.

The flowers are formed by wrapping copper wire around the different-sized circles.

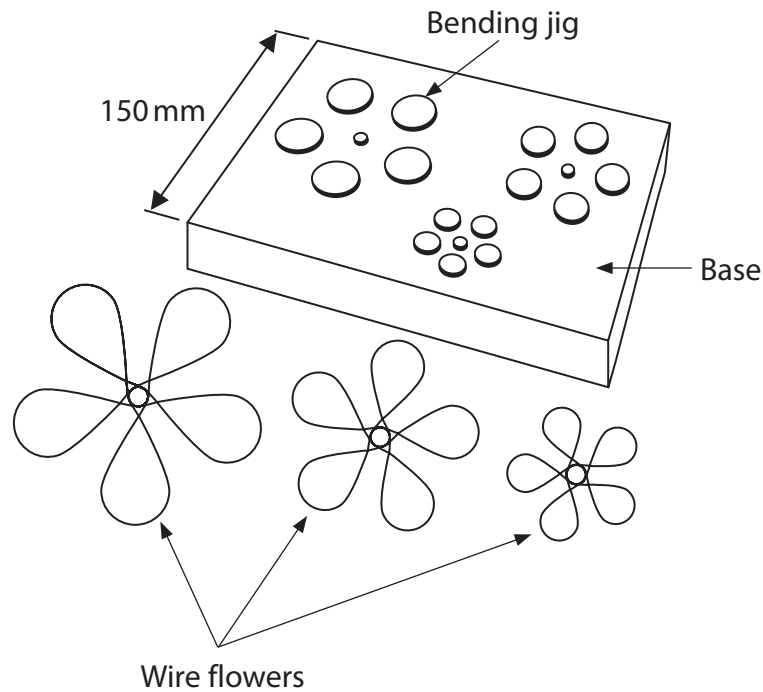


Figure 2

- (a) Name **one** manufactured timber that could be used to make the base of the bending jig.

(1)

- (b) Prototype wire flowers were made using shape memory alloys (SMAs) to test the design before producing the final product from copper wire.

Explain **one** reason for using SMAs to make the prototype wire flowers.

(2)



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Figure 3 shows two of the circles used on the bending jig.

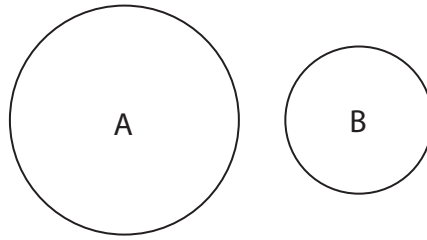


Figure 3

Diagram not to scale

The two circles have different diameters in the ratio of 5:3.

(c) (i) Calculate the radius of circle B if circle A has a radius of 35 mm.

(2)

Radius of circle B mm

(ii) Calculate the area of circle A giving your answer to the nearest cm^2 .

(2)

Use $\pi = 3.142$

Area of circle A cm^2



(d) Explain **one** reason why copper wire was used to make the flowers.

(2)

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(Total for Question 2 = 9 marks)

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3 Figure 4 shows a games controller.

The case is made from high impact polystyrene (HIPS).



Figure 4

(a) Other than impact resistance, give **one** property of HIPS that makes it an appropriate material from which to make the case.

(1)

(b) The games controller is only sold online and is sent through the post in a corrugated board package.

Explain **one** reason for using corrugated board to make the package.

(2)



(c) The manufacturer is developing a new games controller that uses robotic materials.

Explain **one** way that robotic materials can be used in the new games controller.

(2)

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(d) The original games controller cost £12.50 and the new games controller costs £19.00.

Calculate the percentage increase in the cost of the new games controller.

(2)

Percentage increase %

(e) Explain **two** environmental issues related to the development and release of the new games controller.

(4)

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(Total for Question 3 = 11 marks)



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4 Figure 5 shows a picture of a firefighter.



(Source: © John Kasawa/Shutterstock)

Figure 5

The firefighter's uniform has electronic sensors built into it to detect heat.

(a) Name an electronic sensor that is used to sense heat.

(1)

(b) The firefighter's uniform is made from protective textiles.

Explain **one** disadvantage for the firefighter of wearing a uniform made from protective textiles.

(2)



(c) The firefighter's uniform contains an electronic system which is powered by a small 9V battery.

(i) Draw the circuit symbol for a battery in the space below.

(1)

Figure 6 shows some information about the battery and the consumption rate for the electronic system used in the firefighter's uniform.

Analyse the information.

Battery capacity (mAh)	1000
Load current (mA)	350
Consumption rate	0.7

Figure 6

(ii) Calculate the battery life for the electronic system used by the firefighter's uniform.

Use the formula below to calculate the answer.

Give your answer in minutes.

(2)

$$\text{Load current (mA)} = \frac{\text{Battery capacity (mAh)} \times \text{Consumption rate}}{\text{Battery life (hours)}}$$

Battery life minutes



(d) Discuss the use of video conference meetings by companies around the world to develop new technologies for firefighters.

(6)

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(Total for Question 4 = 12 marks)

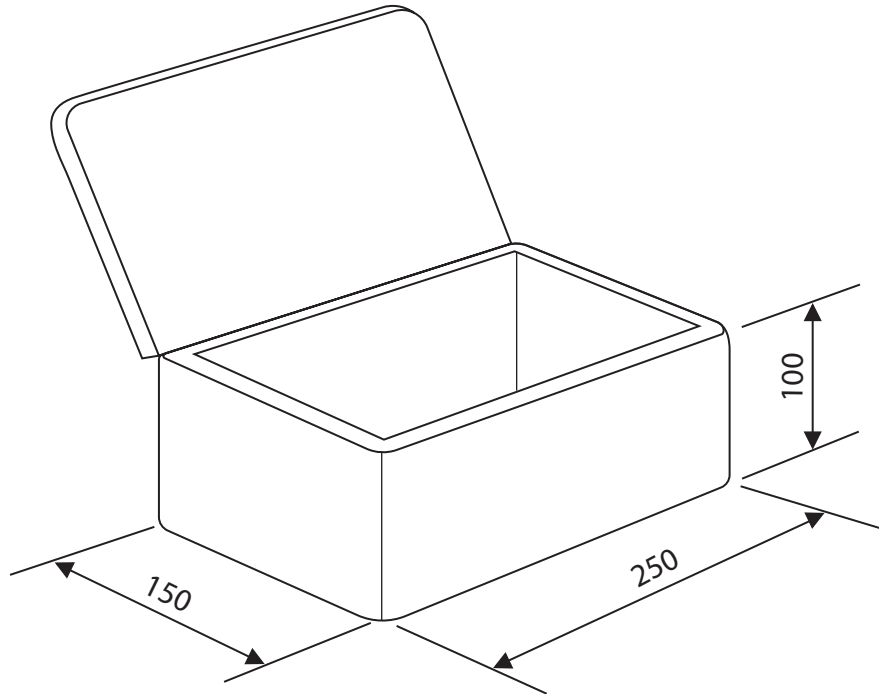
TOTAL FOR SECTION A = 40 MARKS



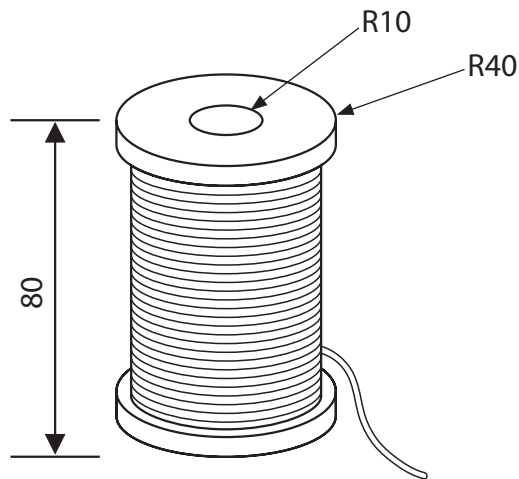
SECTION B – TEXTILES

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

- 5** Figure 7 shows a design solution for a fabric covered sewing box together with some additional information.



Additional information



All dimensions in mm

Figure 7

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(a) The fabric covered sewing box needs to be improved to include the following specification points.

The sewing box must:

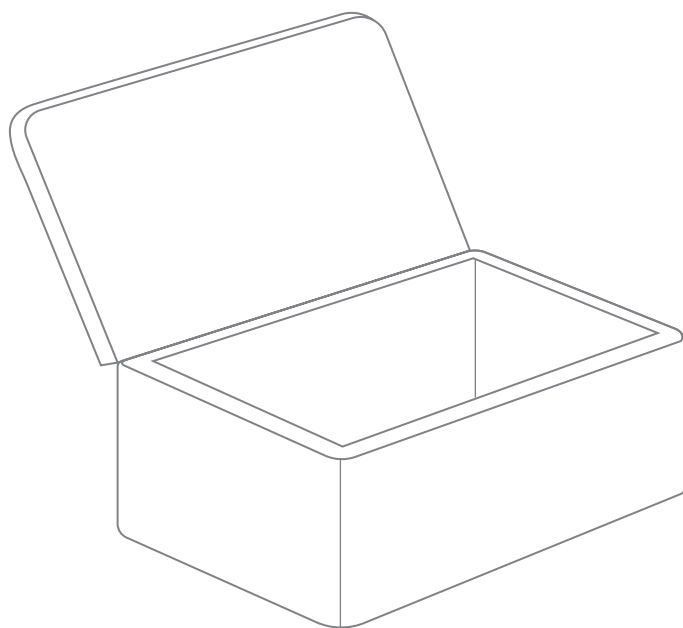
- be able to be transported around the house easily and have a lid that can be secured
- provide a storage place for pins and needles that can be easily accessed
- allow for three reels of thread to be stored without them getting tangled.

Use notes and sketches to show how the fabric covered sewing box 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.

Use the outline of the original design solution to show your modifications.

(6)



(b) Figure 8 shows some examples of felt tags that shopkeepers use on their jars of jam.

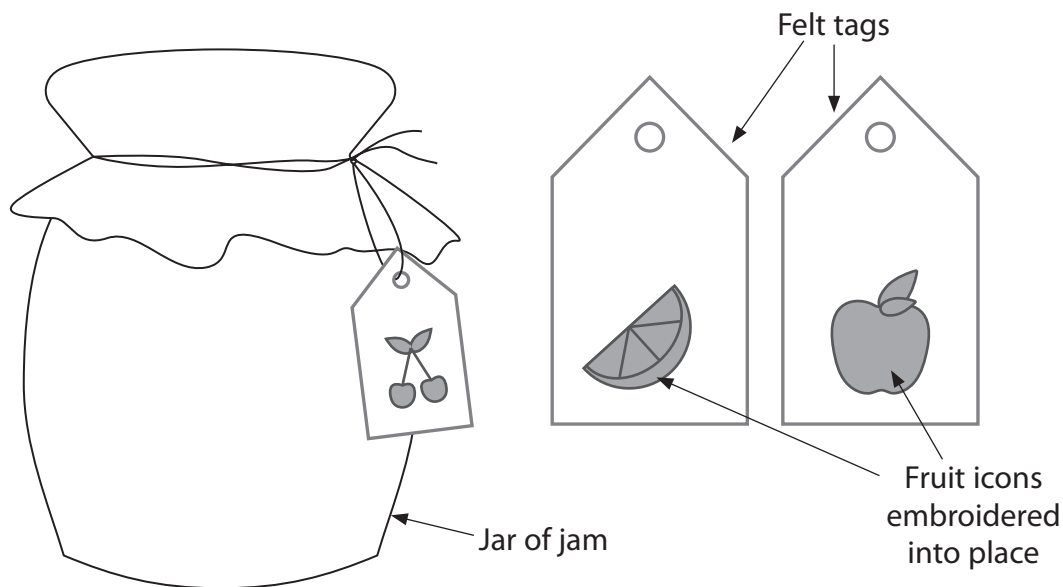


Figure 8

Explain **two** ways that the felt tags meet or fail to meet the criteria of providing a method to show customers the flavours of the jams.

(4)

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(Total for Question 5 = 10 marks)



6 Figure 9 shows a dog coat. It has an outer layer made from polyester fabric and a quilted panel.

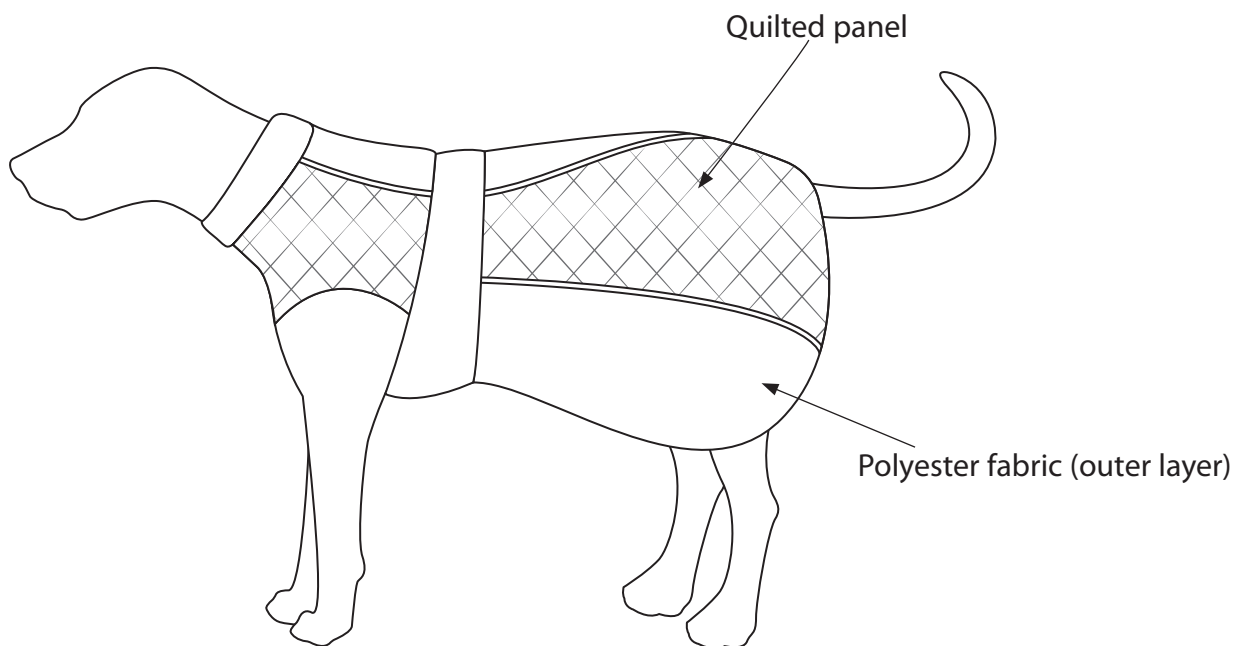


Figure 9

(a) Explain **two** availability factors that could result in polyester fabric being hard to source. (4)

1

2

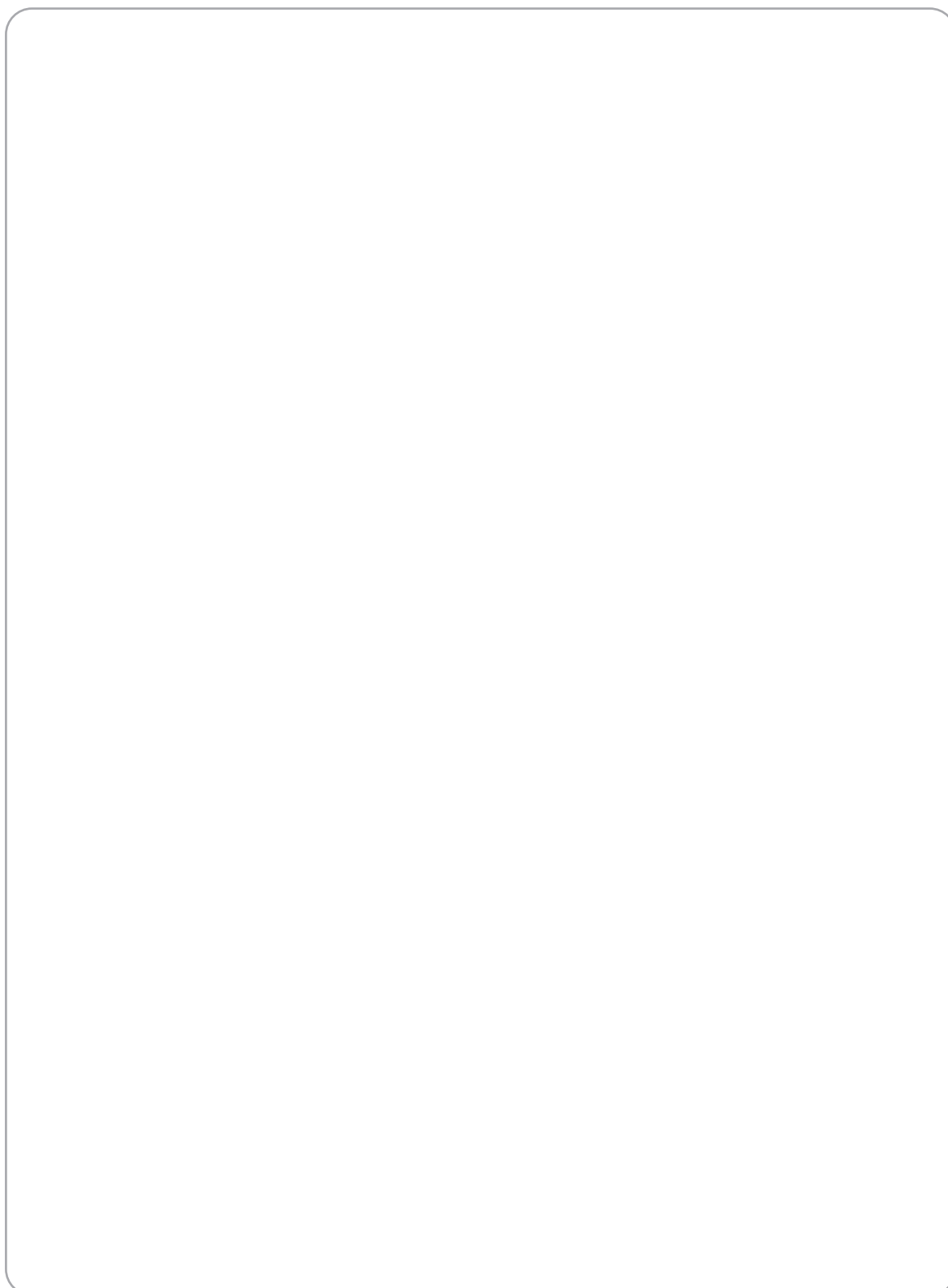


(b) The dog coat includes a quilted panel.

Use notes and sketches to show how a panel of fabric should be quilted.

You will be marked on how you apply your understanding of design and technology, not your graphical skills.

(4)



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(c) Fabric measuring 137 cm wide is supplied to the manufacturer of the dog coat.

Explain **one** reason why the manufacturer would use 137 cm wide fabric for the dog coat.

(2)

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P 6 2 0 0 8 A 0 1 7 2 8

(d) Give **two** different properties of polyester fibre that make it appropriate for use in the outer layer of the dog coat.

For each property, explain **one** advantage of using polyester fibre for the outer layer of the dog coat.

(6)

Property 1

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Explanation

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Property 2

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Explanation

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(Total for Question 6 = 16 marks)



7 Figure 10 shows a glasses case made from a single piece of fabric.

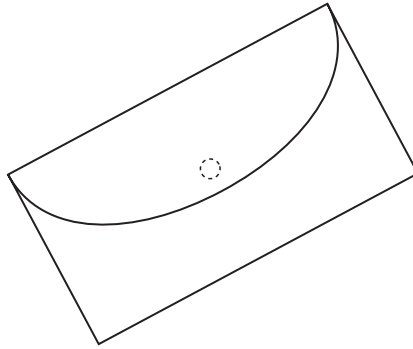


Figure 10

(a) Name **one** specific type of stitching that should be used to finish the raw edges of the fabric for the glasses case.

(1)

Figure 11 shows a template that is used when marking out the shape of the glasses case.

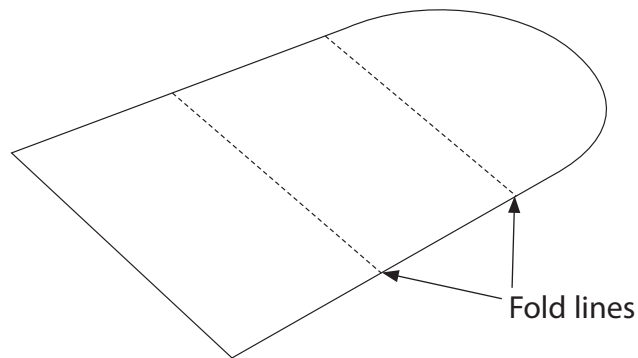


Figure 11

(b) Explain **two** advantages of using a template to mark out the shape of the glasses case when manufacturing in large quantities.

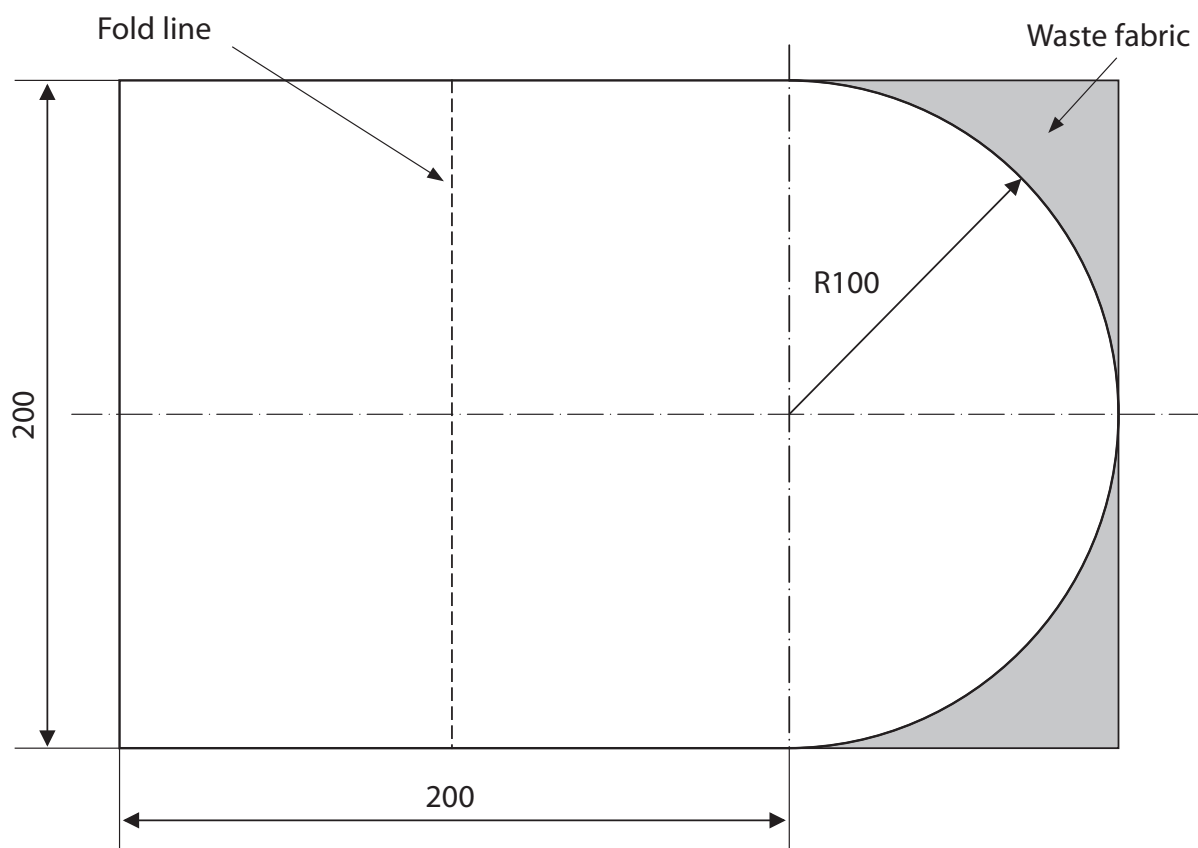
(4)

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Figure 12 shows the template placed over a rectangular strip of fabric. The shaded area shows the waste fabric.



All dimensions in mm

Figure 12

Use $\pi = 3.142$

(c) Calculate the amount of waste fabric shown.

Give your answer to the nearest whole cm^2 .

(5)

Answer cm^2



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(d) The glasses case can be customised by using a laser cutter.

Explain **two** ways that a laser cutter can be used to include the owner's initials on the glasses case.

(6)

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(Total for Question 7 = 16 marks)



8 Figure 13 shows a pair of nylon running tights.



Figure 13

(a) The fabric of the nylon running tights has been microencapsulated.

Explain **one** reason why you would include a microencapsulation treatment in the nylon running tights.

(2)

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(b) Explain **one** reason for using a stock denier yarn to manufacture the nylon running tights.

(3)

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(c) Explain **two** reasons why nylon may be considered an unsustainable fibre.

(4)

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- (d) The nylon running tights are manufactured in Europe and transported all around the world.

Figure 14 shows information about the running tights.

Scale of production	Mass
Potential market	World wide
Life span	6 months
Intended market	Runners – men and women
Fabric treatment	Microencapsulated

Figure 14

Analyse the information in Figure 14.

Evaluate the running tights with reference to cultural and ethical factors including:

- suitability for intended market
- the consumer society
- built-in product obsolescence.

(9)



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(Total for Question 8 = 18 marks)

TOTAL FOR SECTION B = 60 MARKS

TOTAL FOR PAPER = 100 MARKS



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