

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 24 May 2019**

Afternoon (Time: 1 hour 45 minutes)

Paper Reference **1DT0/1B**

**Design and Technology**  
**Component 1: Papers and Boards**

**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**

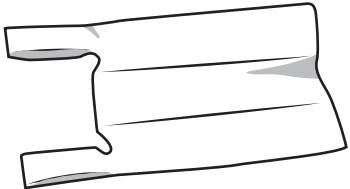
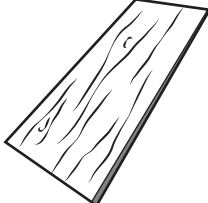
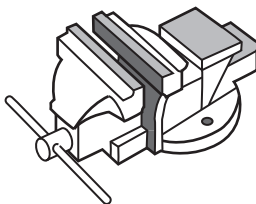

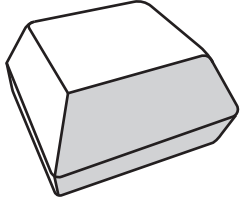
**Answer ALL questions. Write your answers in the spaces provided.**

- 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.

Product	Product material	Property
	Biodegradable plastic shopping bag	Will degrade in soil
	Cedar roof tile	(1) (i) .....
	Cast iron workshop vice	(1) (ii) .....
	Polyester raincoat	(1) (iii) .....
	Solid white board burger package	(1) (iv) .....

**Figure 1**

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(b) Figure 2 shows a table with the number of plastic bags given away in England.

Year	Number of bags given away (billions)
2014	7.6
2015	5.4

**Figure 2**

Calculate the percentage reduction in the number of plastic bags given away between 2014 and 2015.

Give your answer to the nearest whole number.

(2)

Percentage reduction .....

(c) In 2015 charging for carrier bags was introduced resulting in a reduction in the number of bags being manufactured.

Explain **one** negative effect of this reduction for the manufacturer.

(2)

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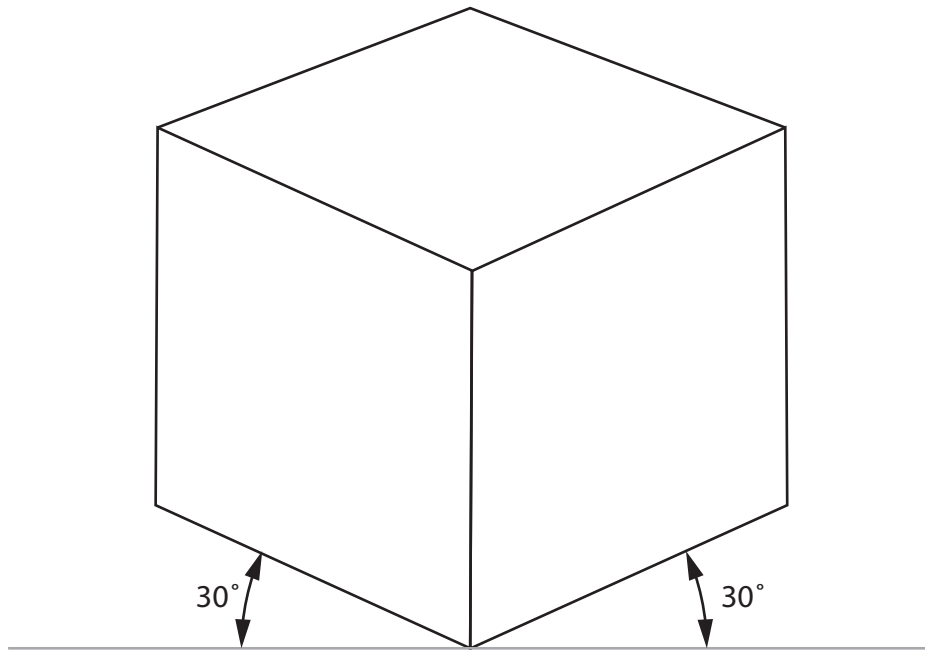
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**(Total for Question 1 = 8 marks)**



- 2 Figure 3 shows a drawing of a fabric play cube for young children.  
The fabric play cube has a side length of 60 mm.



**Figure 3**

- (a) Name the communication technique that has been used to produce the drawing shown in Figure 3.

(1)

- (b) A prototype play cube was made from calico.

Explain **one** reason for using calico for the prototype play cube.

(2)



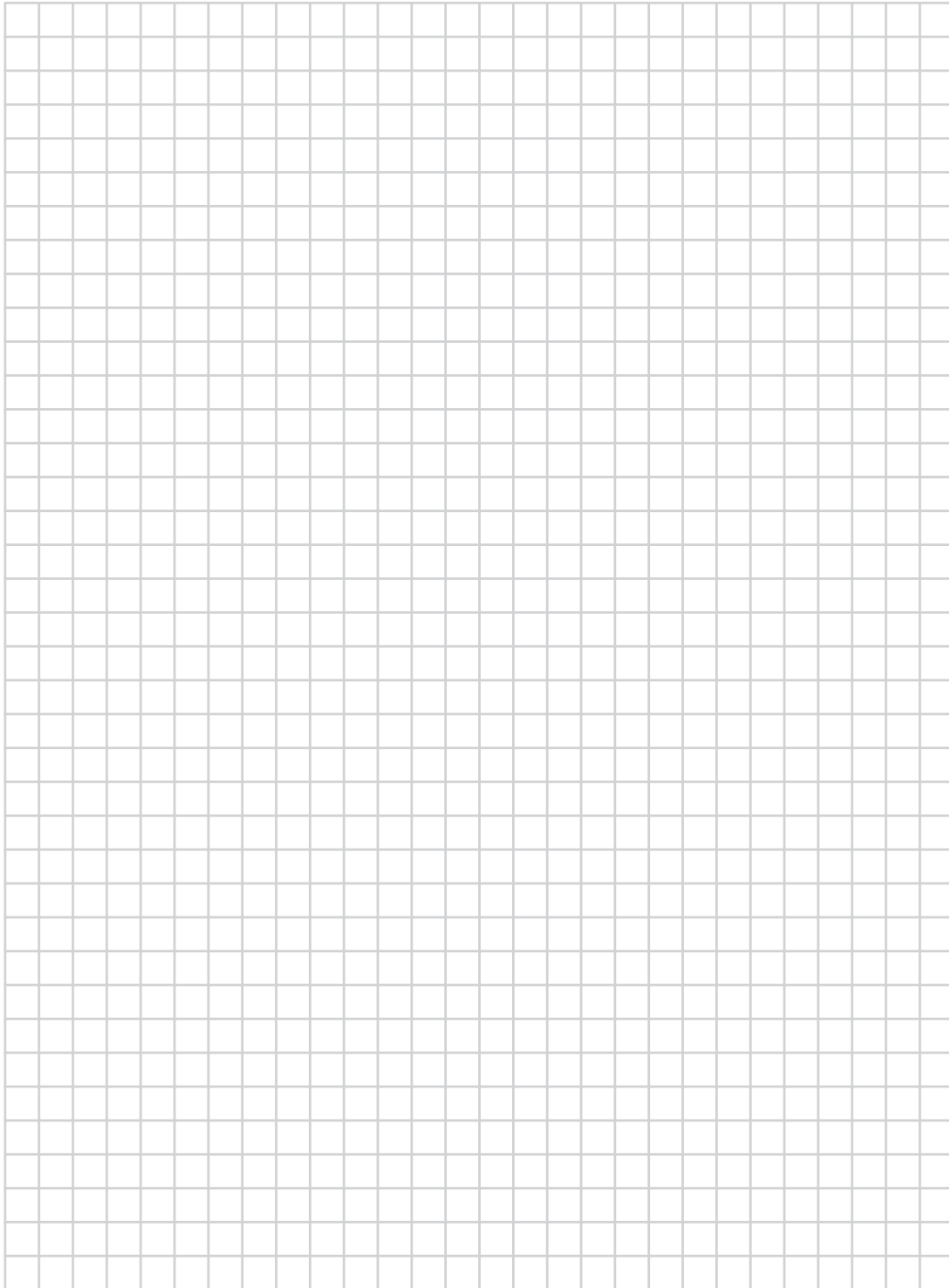
(c) The pattern for the prototype play cube was made from a single net.

Draw a net for the play cube on the grid provided below.

Do not include any seam allowance.

Use a dashed line - - - - to show where the net would be folded.

(4)



Each square represents 10 mm



(d) Tracing paper was used to design the prototype play cube.

Explain **one** reason why designers use tracing paper.

(2)

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**(Total for Question 2 = 9 marks)**

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3 Figure 4 shows part of a solar powered garden light.

The outer case is made from acrylic.

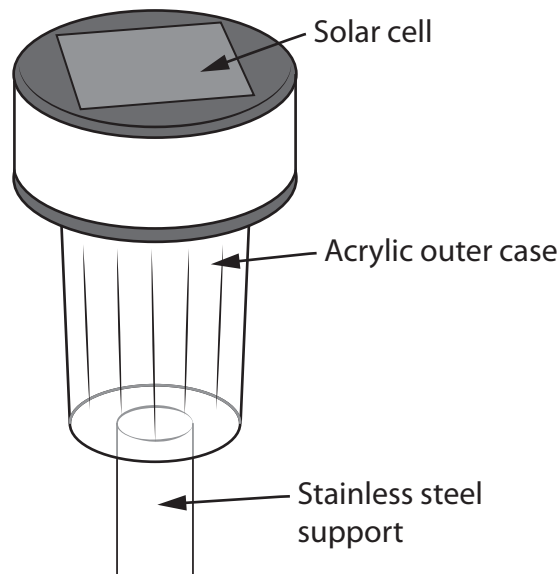


Figure 4

(a) Give **one** property of acrylic that makes it an appropriate material from which to make the outer case.

(1)

(b) The solar powered garden light is held off the ground by a stainless steel support.

Explain **one** reason for using stainless steel for the support.

(2)

(c) The manufacturer of the solar powered garden light wants to reduce its carbon footprint.

Explain **one** way new and emerging technologies could be used to reduce the manufacturer's carbon footprint.

(2)



(d) The solar cell used in the solar powered garden light costs  $\frac{1}{12}$ th of the total cost of the product.

Calculate the cost of the solar cell if each light costs £4.97 to make.

Give your answer to two significant figures.

(2)

£ .....

(e) The manufacturer of the solar powered garden light employs different groups of people including apprentices.

Explain **two** ways that the use of new and emerging technologies could affect the apprentices.

(4)

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**(Total for Question 3 = 11 marks)**





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4 Figure 5 shows a drawing of a jewellery box made from mahogany.

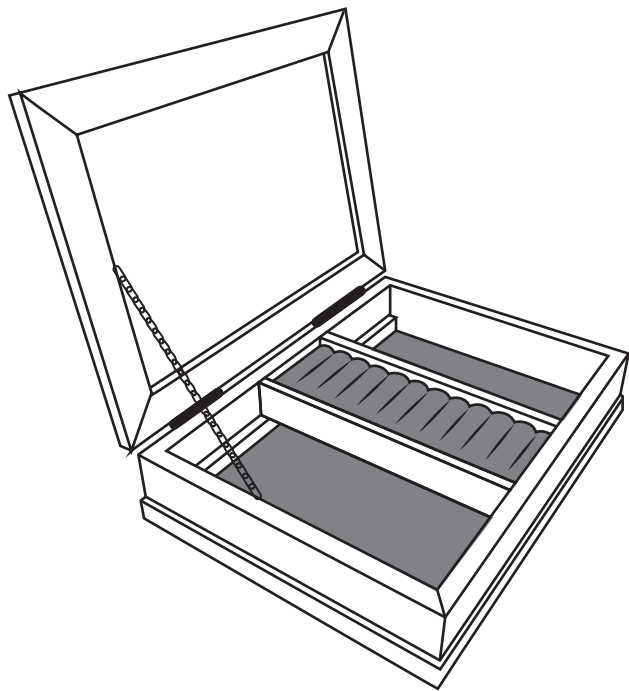


Figure 5

The electronic component shown in Figure 6 is used in the jewellery box.

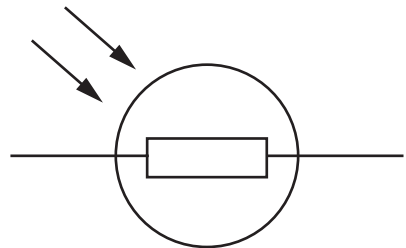


Figure 6

(a) (i) Name the electronic component shown in Figure 6.

(1)



- (ii) The jewellery box uses a programmable component to turn on a musical tune when the lid is opened, that stays on until the lid is closed.

Figure 7 shows a partly completed flowchart for the programmable component.

Correctly label the **decision outputs** and add the remaining **lines** and **arrows** on the flowchart to show how the programmable component:

- turns on the musical tune when the lid is opened
- turns off the musical tune when the lid is closed.

(3)

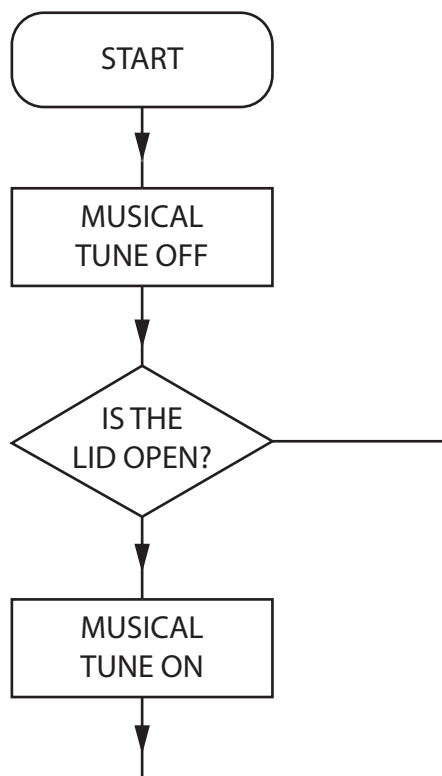


Figure 7



(b) Analyse the information in Figure 8 about the sources of mahogany.

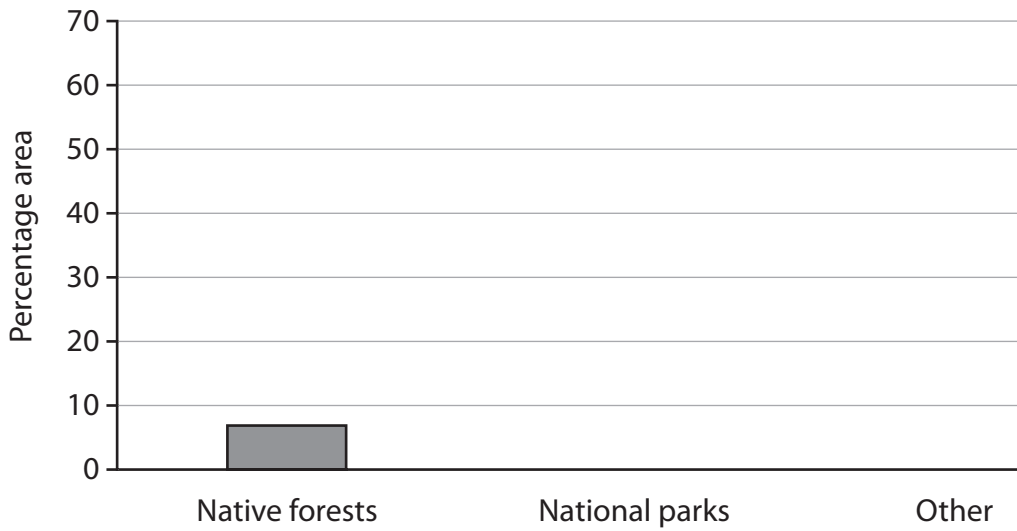
Sources of mahogany	Percentage grown in each area (%)
Native forests	7
National parks	30
Other	63

Figure 8

Complete the bar chart below to show the percentage grown in each area.

The first one has been done for you.

(2)



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(c) A film company is considering launching a range of musical jewellery boxes based on its animated characters.

Discuss the different design strategies the company could use to generate initial ideas and to avoid design fixation.

(6)

Area with horizontal dotted lines for writing.



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Area with horizontal dotted lines for writing.

**(Total for Question 4 = 12 marks)**

**TOTAL FOR SECTION A = 40 MARKS**

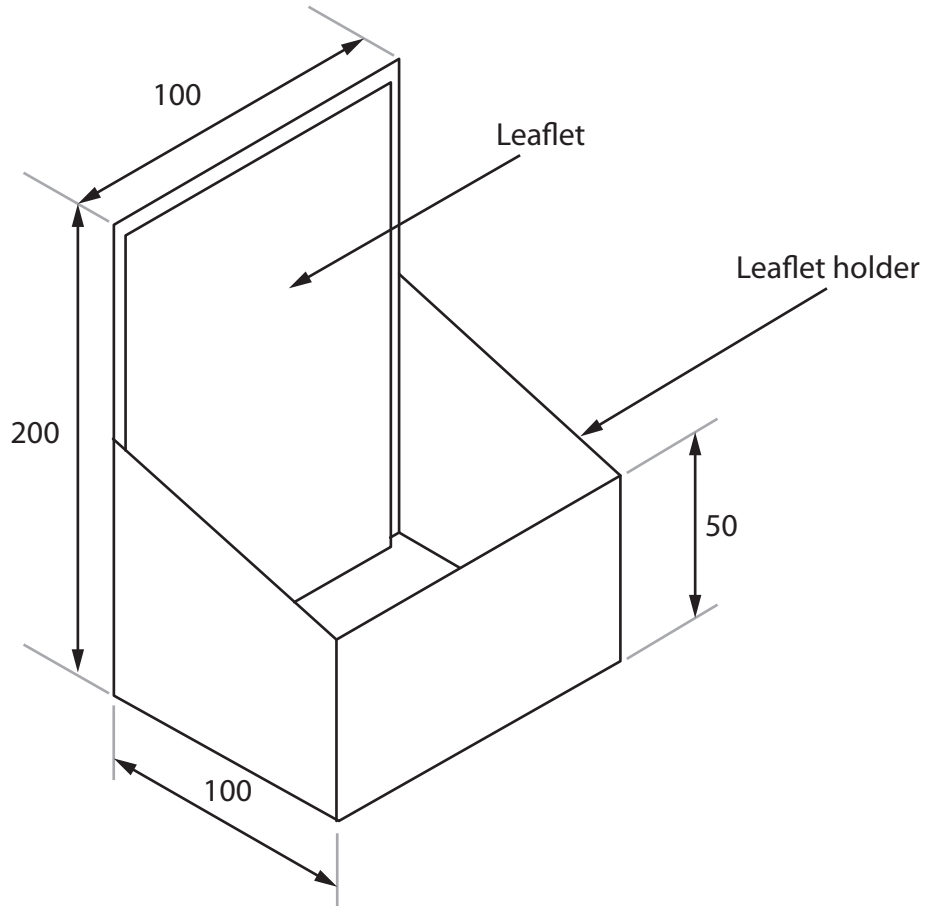


P 5 9 6 6 3 A 0 1 3 2 8

**SECTION B – PAPERS AND BOARDS**

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

- 5** Figure 9 shows a design solution for a leaflet holder together with some additional information.



Additional information



All dimensions in mm

**Figure 9**

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(a) The leaflet holder needs to be improved to include the following specification points.

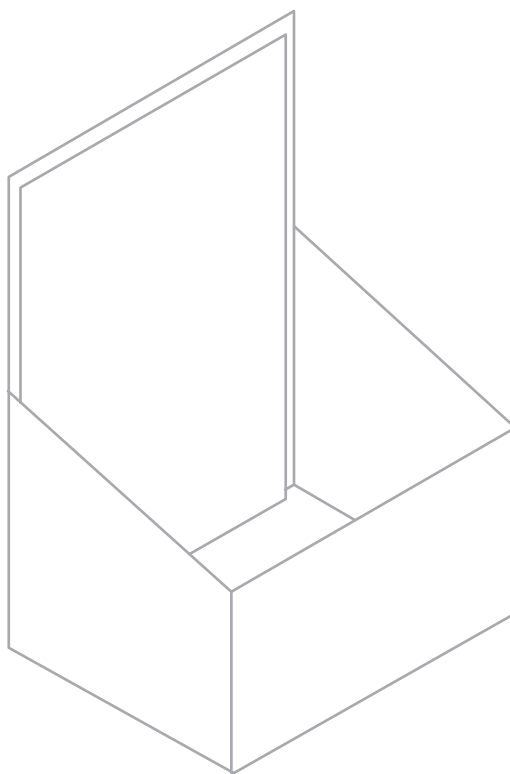
The leaflet holder must:

- provide a method of holding the vouchers separately from the leaflets while allowing the vouchers to be removed easily
- provide a method of adding additional signage that is also detachable
- provide a method of holding a pen that prevents it from being taken away.

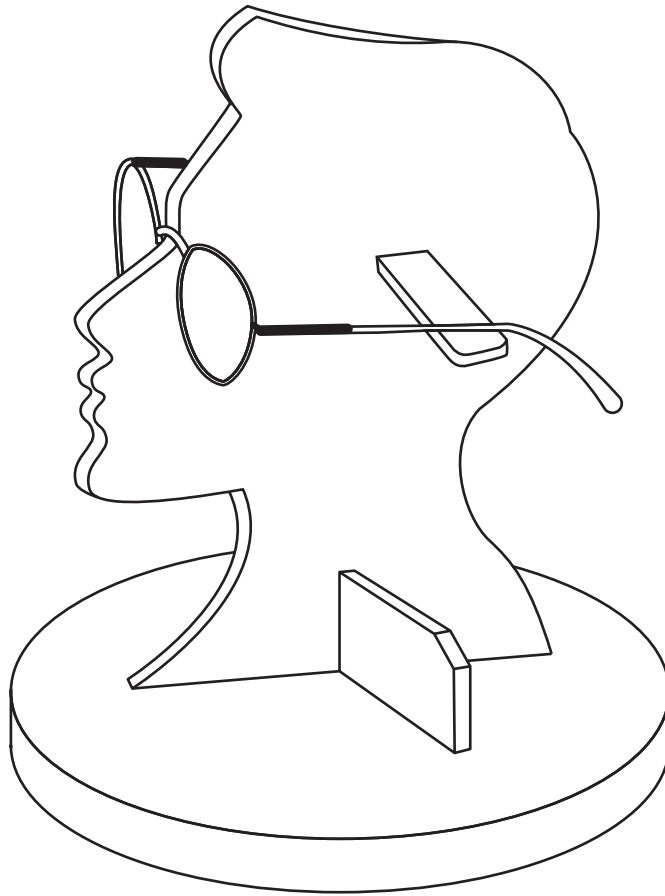
Use notes and sketches, on the outline below, to show how the leaflet holder could be modified to include these specification points.

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

(6)



(b) Figure 10 shows a solid white board retail display unit for a pair of glasses.



**Figure 10**

Explain **two** ways that the retail display unit meets, or fails to meet, the criteria of providing a secure way to display the glasses.

(4)

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**(Total for Question 5 = 10 marks)**





6 Figure 11 shows a model of a windmill made from boards that are sustainable.

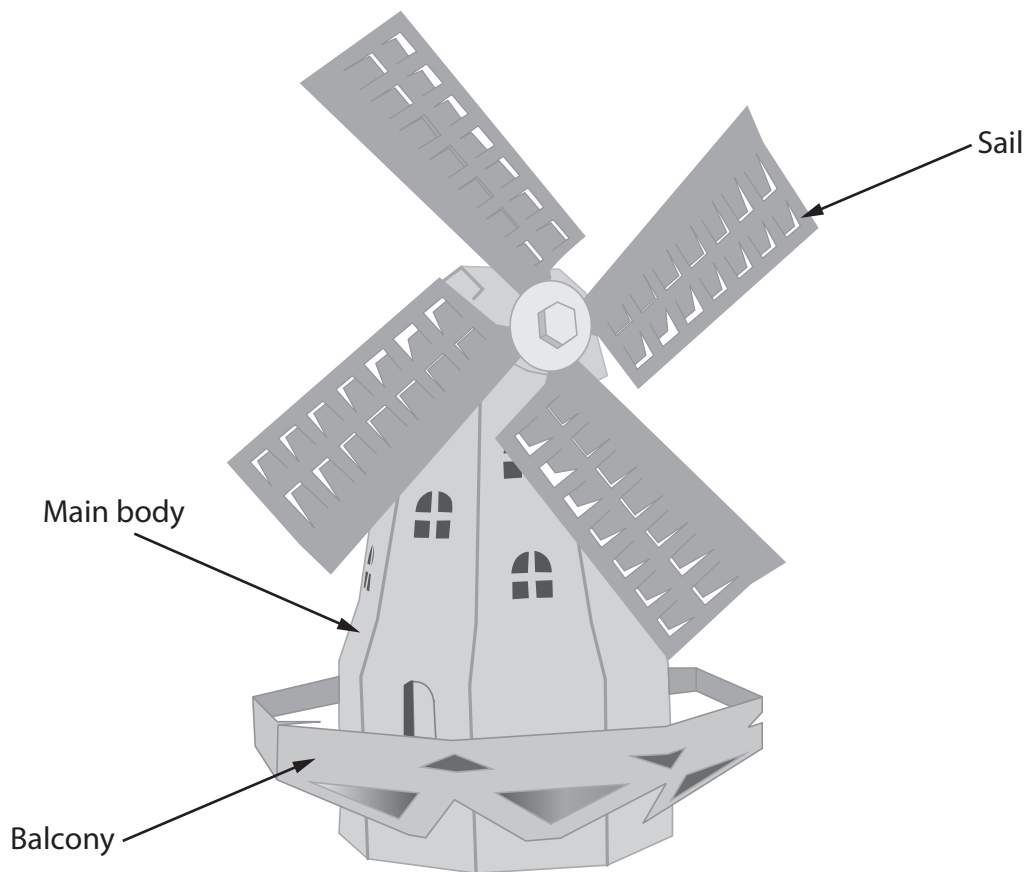


Figure 11

(a) Explain **two** advantages of manufacturing the model windmill from boards that are sustainable.

(4)

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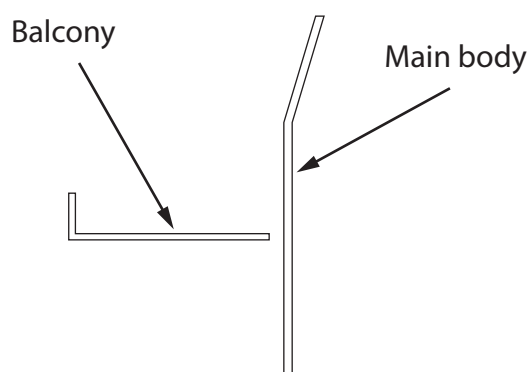
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- (b) Figure 12 shows a side view of the flat part of the balcony separated from the main body of the model windmill.



**Figure 12**

Use notes and sketches, in the space below, to show how to adapt and support the balcony so that it can be permanently attached to the main body using an adhesive.

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

(4)



(c) Explain **one** reason for using different types of board for different parts of the model windmill.

(2)

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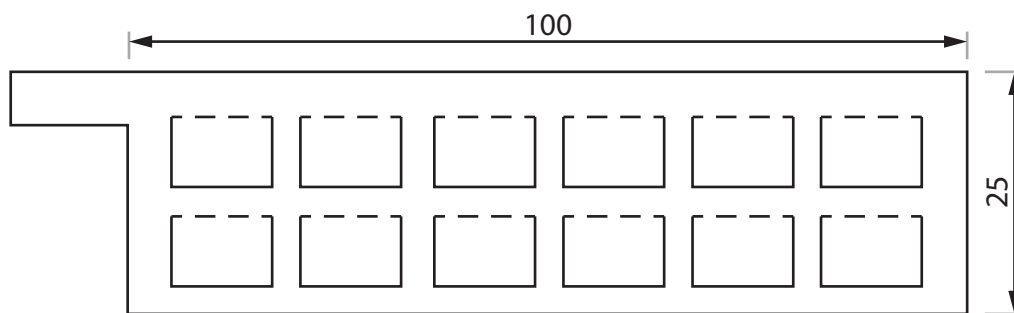
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P 5 9 6 6 3 A 0 1 9 2 8

(d) Figure 13 shows one of the sails of the model windmill.

The sails are to be manufactured from corrugated board in a batch of 1000.



--- Fold lines

All dimensions in mm

**Figure 13**

Name **two** different techniques that could be used to batch produce the sails.

Explain **one** advantage of using each technique.

(6)

Technique 1

Explanation

Technique 2

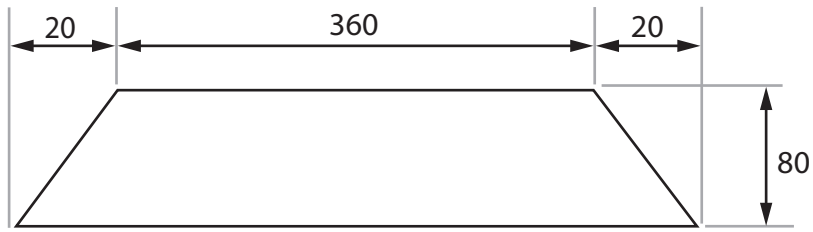
Explanation

**(Total for Question 6 = 16 marks)**





(c) Figure 15 shows the dimensions for the decorative side panel.



All dimensions in mm

Diagram not to scale

**Figure 15**

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Calculate the maximum number of whole decorative side panels that could be cut from a length of paper measuring 782 cm long by 8 cm wide.

Ignore the width of any cuts.

(5)

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Answer ..... whole sides



(d) Explain **two** working properties of copier paper that make it an appropriate choice of material for the decorative side panels.

(6)

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(Total for Question 7 = 16 marks)

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8 Figure 16 shows a hardback book.

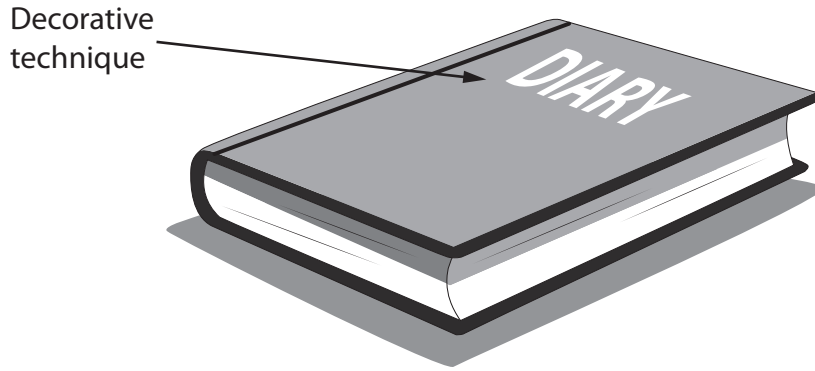


Figure 16

(a) (i) Explain **one** reason for using a decorative technique on the book cover.

(2)

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(ii) Explain **one** working property of bonded paper that makes it suitable for the pages of the hardback book.

(3)

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(b) Explain **two** negative effects on the environment of producing bonded paper.

(4)

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(c) The books are manufactured in Europe and transported worldwide.

Figure 17 shows information about the books.

<b>Scale of production</b>	Mass
<b>Material</b>	Bonded paper
<b>Material source</b>	China, USA and Japan
<b>Size</b>	150 mm wide, 200 mm long
<b>Paper finish</b>	Edge staining

**Figure 17**

Analyse the information in Figure 17.

Evaluate the books with reference to their social footprint including:

- trend forecasting
- impact of logging on communities
- ease and difficulty of recycling and disposal.

(9)

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**(Total for Question 8 = 18 marks)**

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

