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)

Wednesday 18 June 2025

Morning (Time: 1 hour 45 minutes)

Paper reference **1DT0/1C**

Design and Technology

COMPONENT 1: Polymers

You must have:
calculator, ruler, HB pencil, protractor, pair of compasses

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.

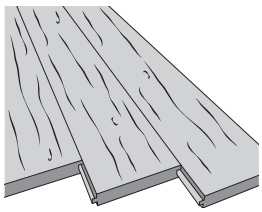
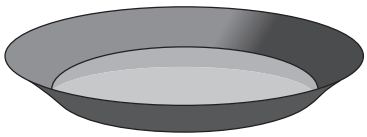
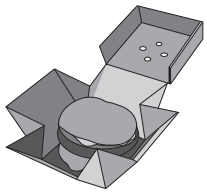
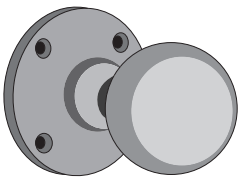
Picture of product	Material and product	Property
	Oak floorboards	Tough
	Wool gloves	**(1)** (i) .....
	Urea formaldehyde picnic plate	**(1)** (ii) .....
	Corrugated board takeaway burger box	**(1)** (iii) .....
	Brass door knob	**(1)** (iv) .....

Figure 1

The oak floorboards are tough.

(b) (i) Explain **one other** property of oak that makes it a suitable choice of material for the floorboards.

(2)

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(b) (ii) The oak floorboards cost £57.60 and cover an area of 1.44 m^2.

Calculate how much the oak floorboards cost per m^2.

(2)

Answer £ .....

(Total for Question 1 = 8 marks)

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2 Origami is a folded paper art form.

Figure 2 shows an origami rabbit. It has been manufactured from copier paper.

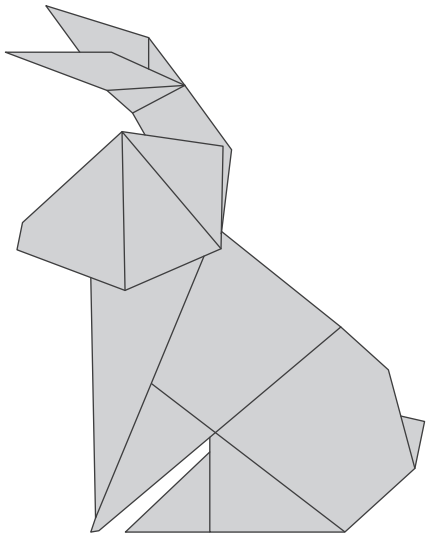

Figure 2

(a) Give **one** property of copier paper that makes it an appropriate choice of material for the origami rabbit.

(1)

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(b) Explain **one** advantage of using recycled copier paper to manufacture the origami rabbit.

(2)

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(c) Explain **one** way that shape-memory alloys (SMAs) can be used to animate a feature of the origami rabbit.

(2)

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Before it is folded, the starting shape of paper for the origami rabbit is a square. The square is cut out from a standard sheet of A4 copier paper.

A standard sheet of A4 copier paper measures 29.7 cm × 21.0 cm.

(d) Calculate the percentage of waste paper if the starting shape of paper for the origami rabbit measures 21.0 cm × 21.0 cm.

Give your answer to the nearest whole number.

(4)

Answer ..... %

(Total for Question 2 = 9 marks)

3 Figure 3 shows an electronic circuit for a voice recorder and a specific electronic component used in the circuit.

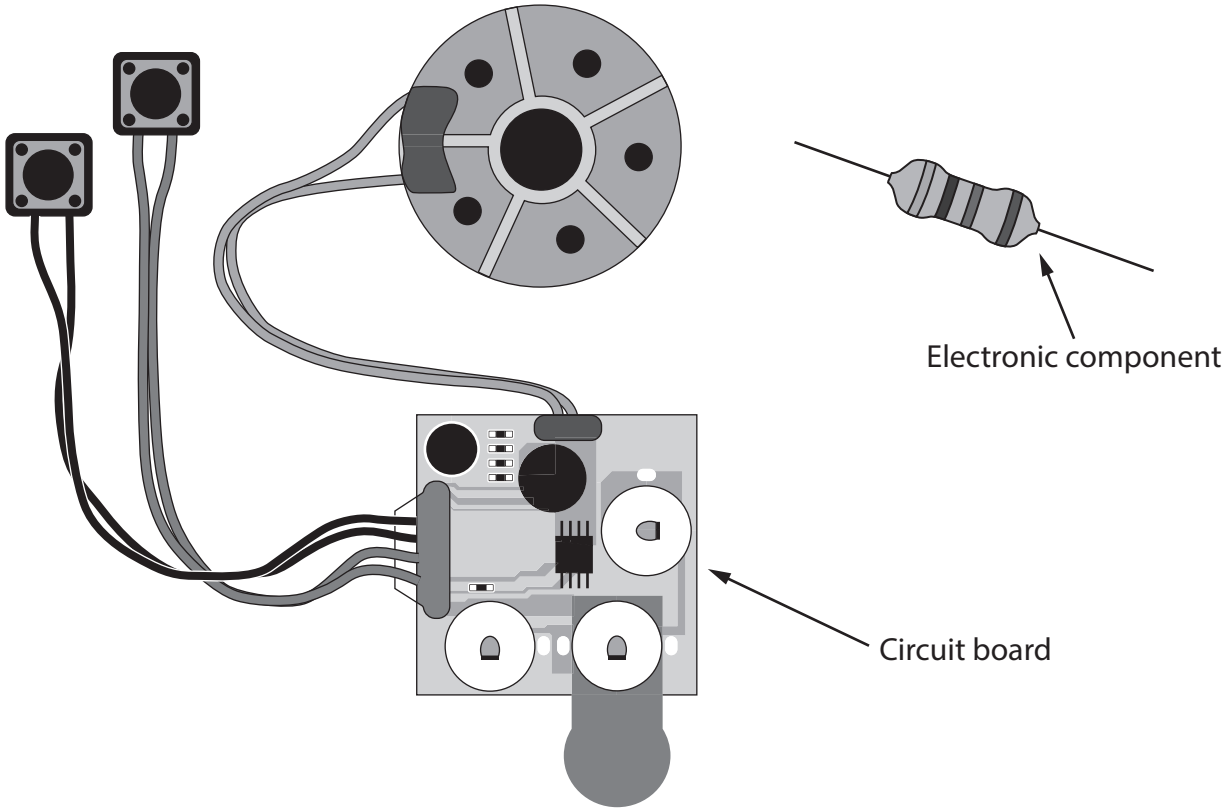

Figure 3

(a) Name the specific type of electronic component shown in Figure 3.

(1)

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(b) Explain **one** advantage for the manufacturer of making the electronic circuit for the voice recorder in batches of 1,000.

(2)

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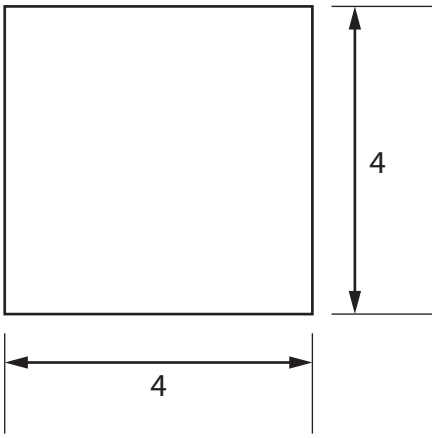
Figure 4 shows the dimensions of the circuit board that is used in the voice recorder.



All dimensions in cm

Diagram not to scale

Figure 4

The circuit boards are cut from a larger sheet of material that costs £3.20.

The larger sheet of material measures 32 cm × 16 cm.

(c) Calculate the cost of each circuit board that can be cut from the larger sheet of material.

You do not have to make any allowance for the width of the cut.

(2)

Answer £ .....

The voice recorder is powered by batteries.

(d) Explain **one** advantage of using batteries to power the voice recorder.

(2)

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Figure 5 shows a Sing Along Box. The voice recorder is fitted inside.

The case for the Sing Along Box is manufactured from high impact polystyrene (HIPS).

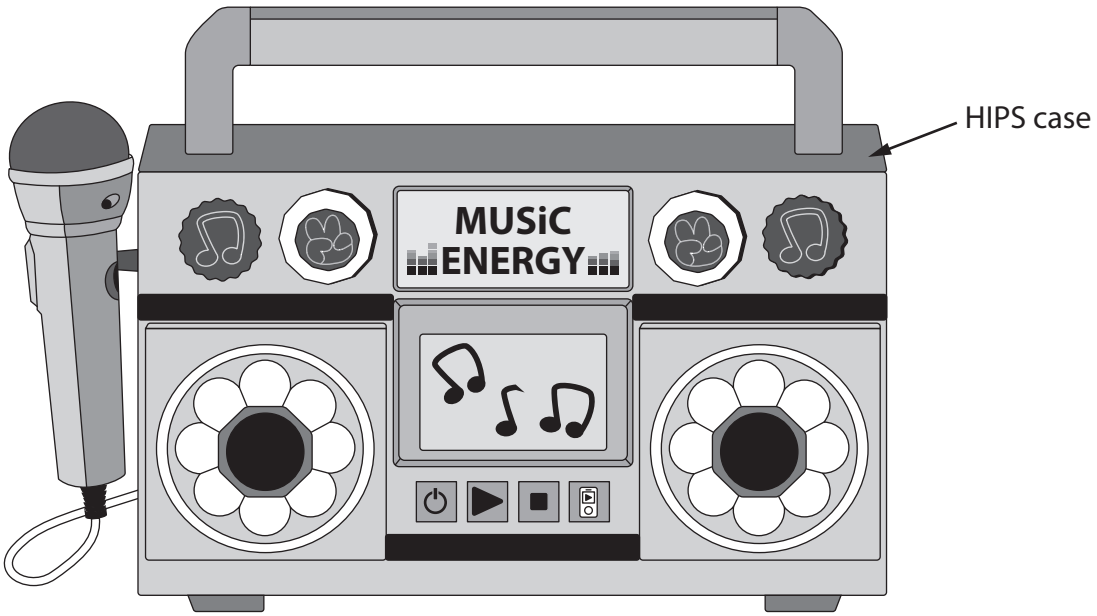

Figure 5

(e) Explain **two** benefits of using HIPS for the case of the Sing Along Box.

(4)

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(Total for Question 3 = 11 marks)

4 Figure 6 shows a salt pot.

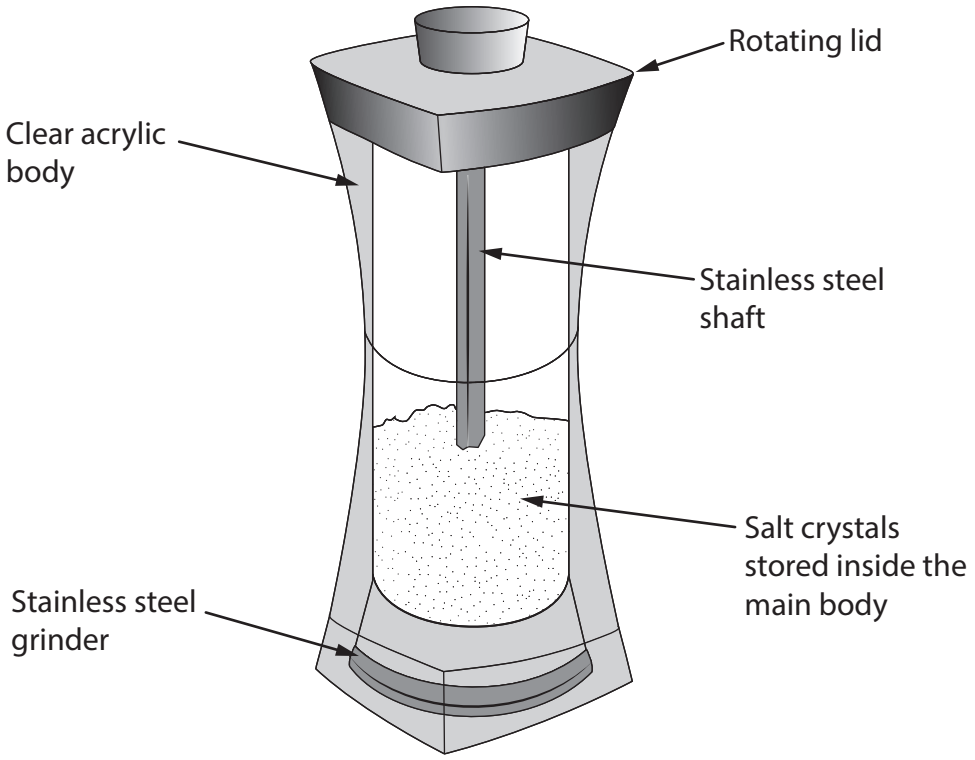

Figure 6

(a) Explain **two** working characteristics of stainless steel that makes it an appropriate material for the shaft and grinder of the salt pot.

(4)

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The salt pot can be easily taken apart at the end of its useful working life so that the different materials can be separated and recycled.

The materials for one salt pot weigh 270 grams.

80% of the materials can be recycled.

(b) Calculate the weight of materials that **cannot** be recycled for one salt pot.

(2)

Answer ..... grams

A designer carried out product disassembly of existing products when developing design ideas for the salt pot.

(c) Discuss why designers carry out product disassembly of existing products when developing design ideas.

(6)

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(Total for Question 4 = 12 marks)

TOTAL FOR SECTION A = 40 MARKS

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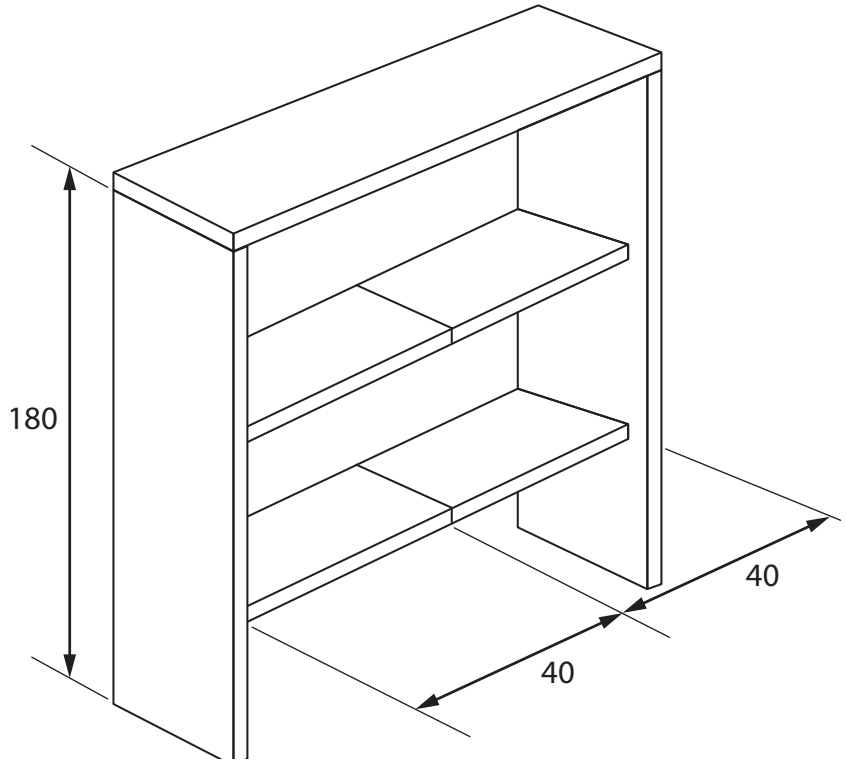
SECTION B

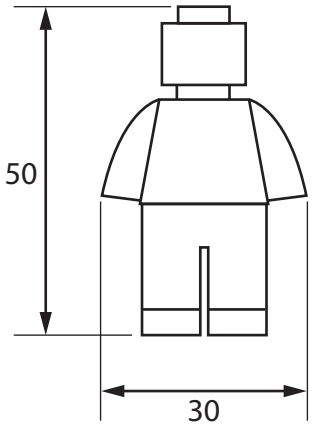
Polymers

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

5 Figure 7 shows a design solution for a polymer shelving unit to display collectable figures together with some additional information.



Additional information – dimensions of collectable figures



All dimensions in mm

Diagram not to scale

Figure 7

(a) The polymer shelving unit currently holds four collectable figures on two shelves and needs to be improved to include the following specification points.

The shelving unit must:

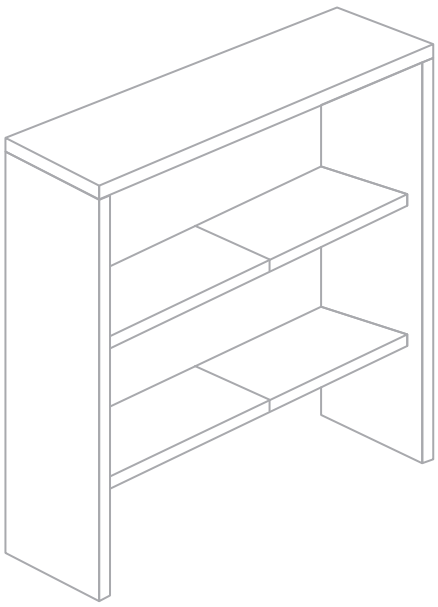
- be able to display an additional four collectable figures and include a method to stop them falling off the shelves
- include a method to stop the collectable figures from being stolen that still allows them to be seen
- be capable of being fixed to a wall and include a lighting system.

Use notes and sketches to show how the shelving unit 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 a number play set for a young child.

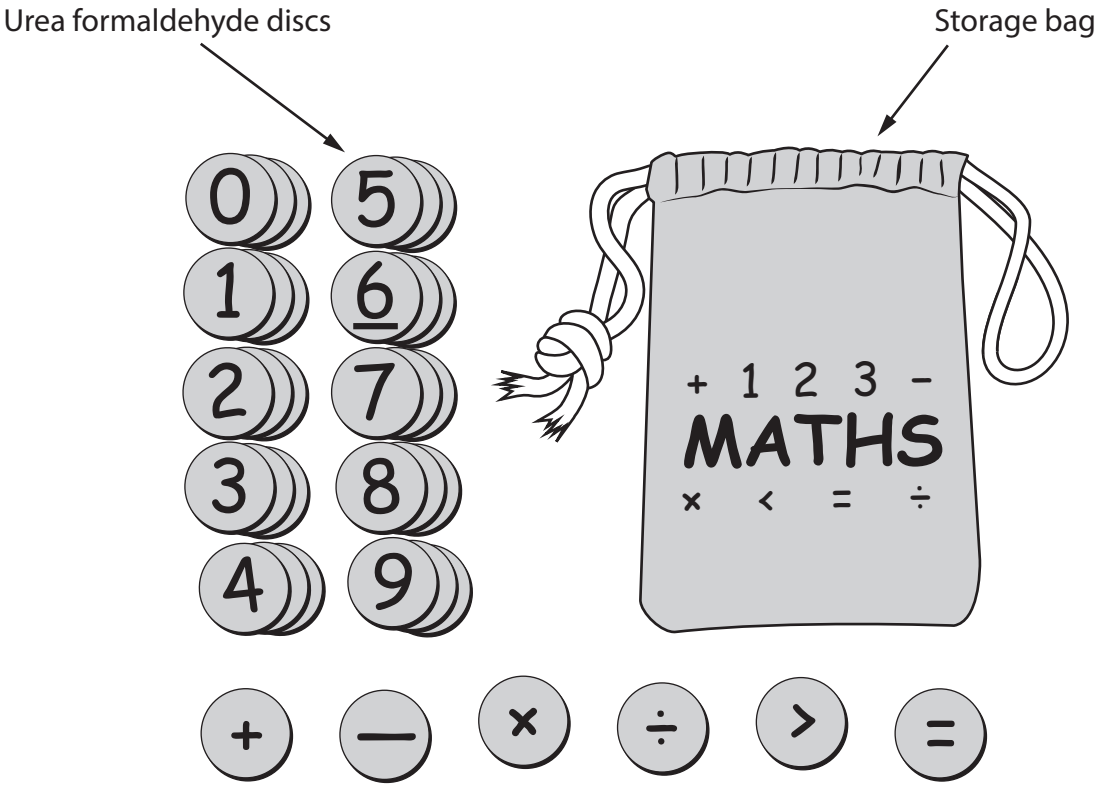


Figure 8

Explain **two** ways that the number play set meets, or fails to meet, the criterion of providing a method to help teach young children about maths.

(4)

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(Total for Question 5 = 10 marks)

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6 Figure 9 shows an acrylic desk tidy.

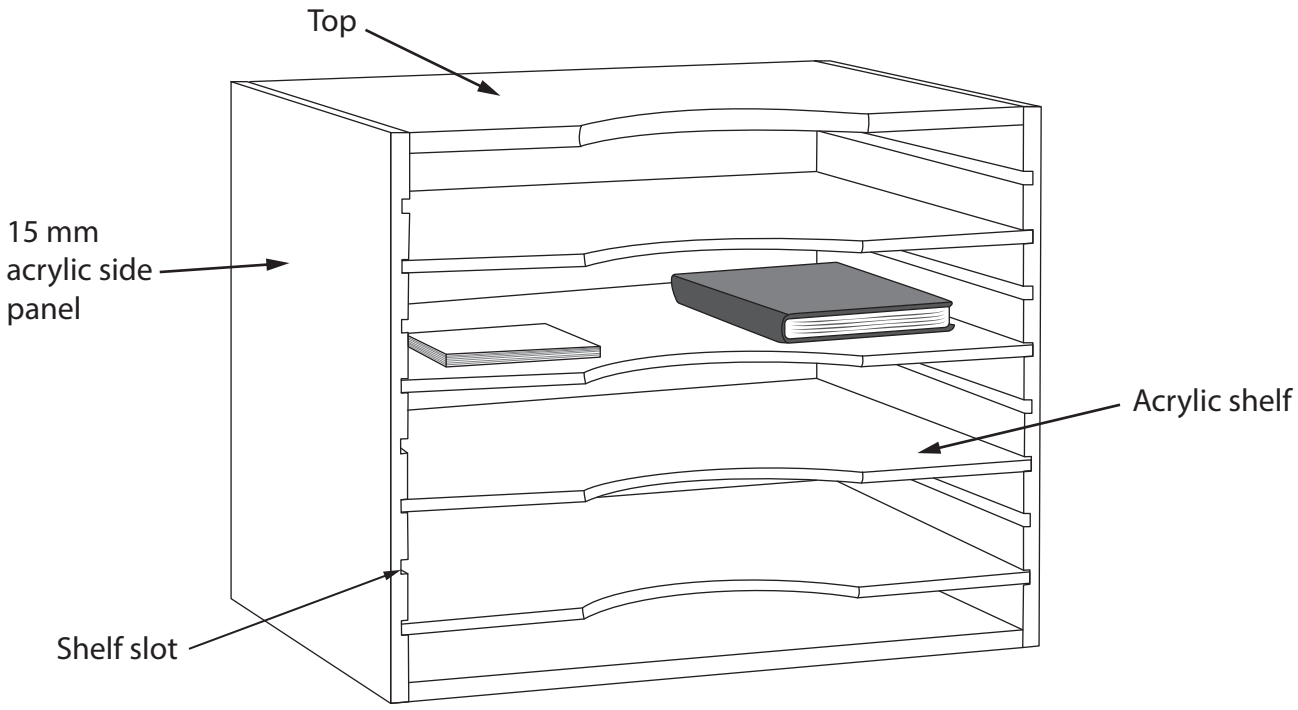

Figure 9

(a) Explain **two** reasons for using acrylic for the desk tidy.

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(b) Figure 10 shows part of a 15 mm acrylic side panel and the top.

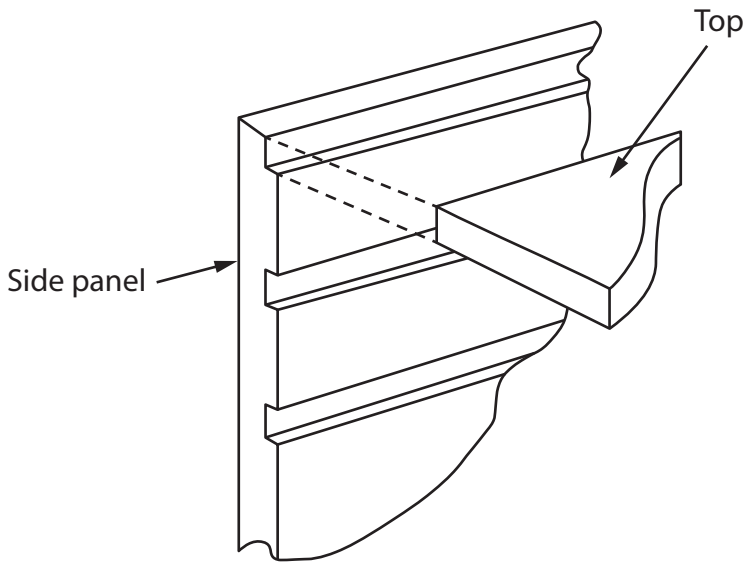

Figure 10

Use notes and sketches, in the space below, to show how a 15 mm acrylic side panel would be joined to the top using Tensol® cement.

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

(4)

Figure 11 shows an expanded polystyrene corner component that is placed over one corner of the desk tidy when it is transported.

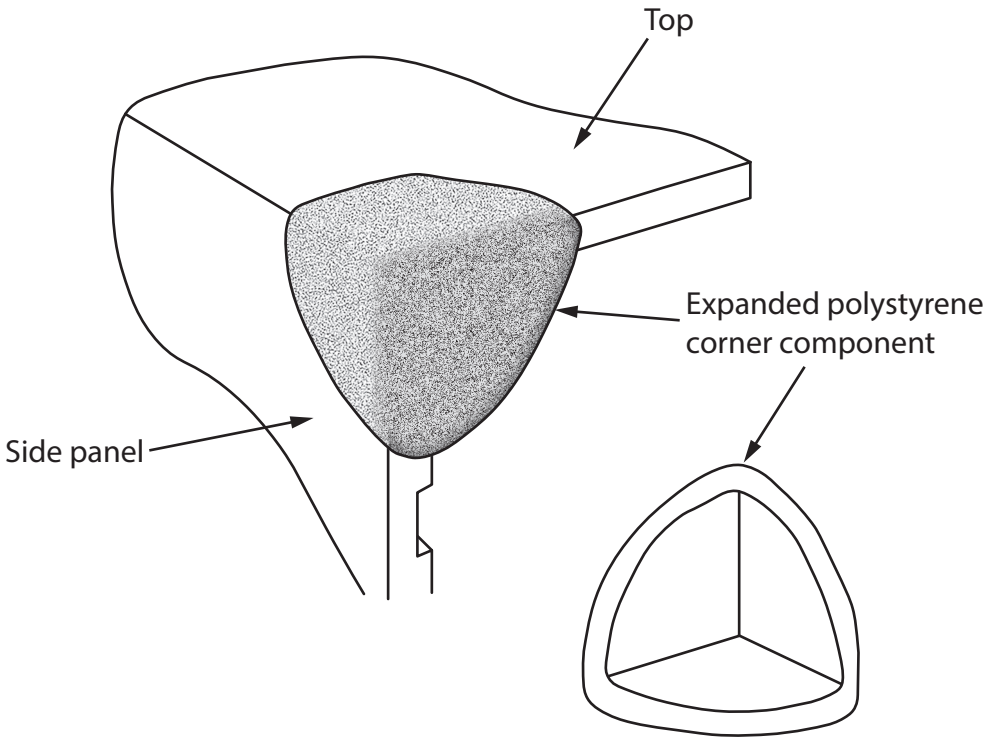

Figure 11

(c) Explain **one** physical characteristic of polystyrene that makes it an ideal material to use for the corner component.

(2)

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Figure 12 shows one of the shelves for the desk tidy.

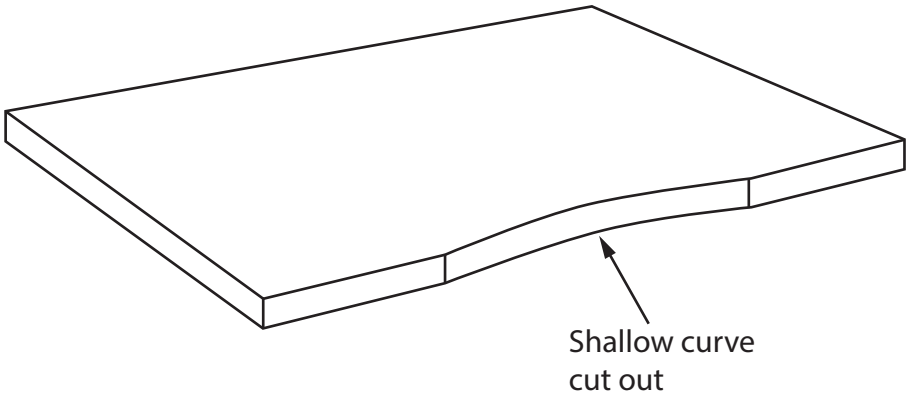

Figure 12

(d) Give **two** different shaping methods that could be used to produce the shallow curve cut out on the shelf as shown in Figure 12.

Explain **one** reason for using each shaping method.

(6)

Method 1

Explanation

Method 2

Explanation

(Total for Question 6 = 16 marks)

7 Figure 13 shows a wall-mounted plant holder and a saw that is used during its manufacture.

The frame has been manufactured from rigid polystyrene stock materials.

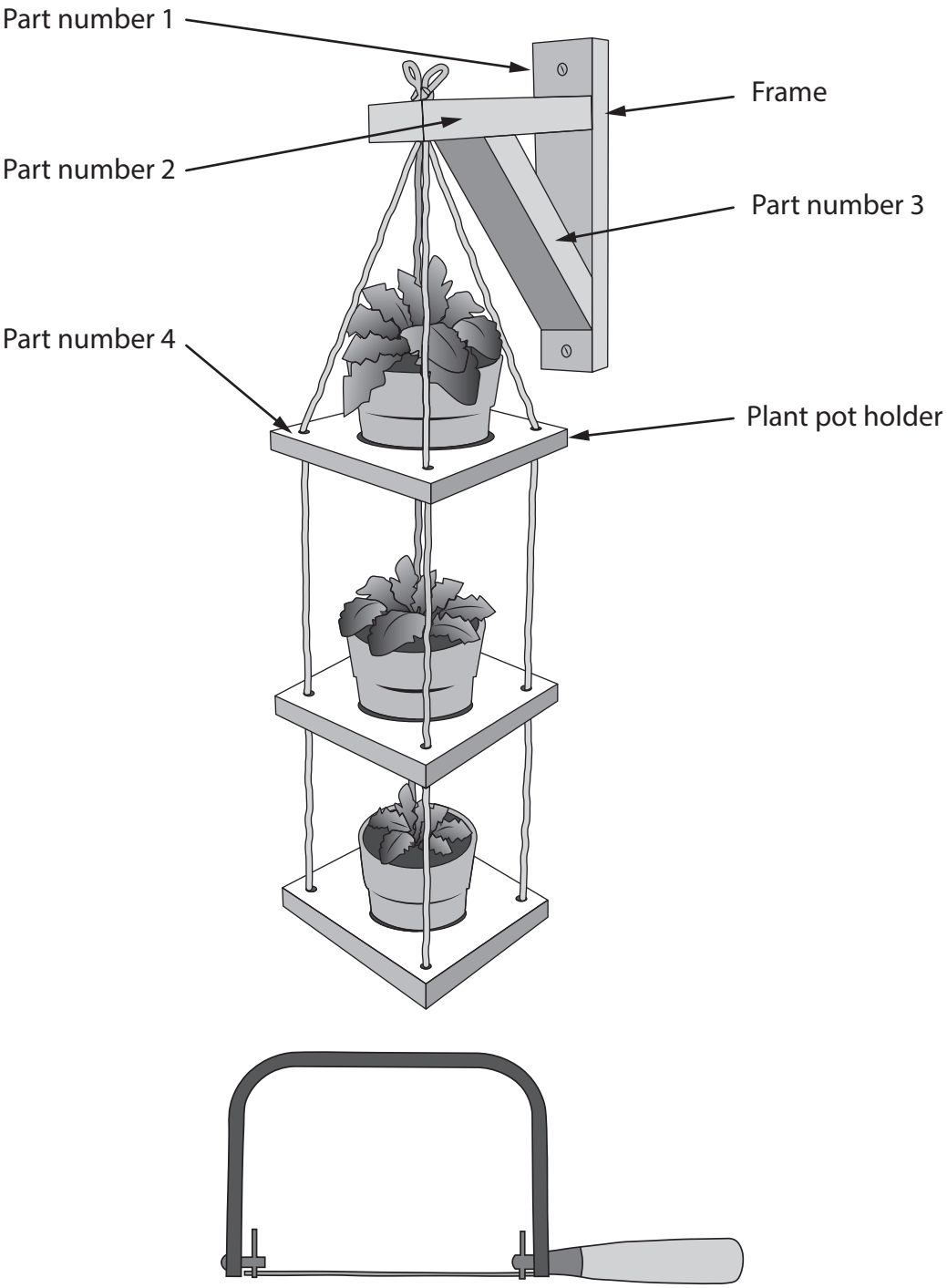

Figure 13

(a) Name the specific type of saw shown in Figure 13.

(1)

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(b) Explain **two** benefits for the manufacturer of using stock materials to manufacture the frame of the wall-mounted plant holder.

(4)

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Figure 14 shows a table of parts required for the wall-mounted plant holder.

Part number	Number required	Length	Width	Thickness
1	1	100	25	22
2	1	100	25	22
3	1	75	25	22
4	3	100	100	18

Figure 14

All dimensions in mm

The rigid polystyrene measuring 25 × 22 costs £2.80 per metre.

The rigid polystyrene measuring 100 × 18 costs £3.30 per metre.

(c) Calculate the total cost of the rigid polystyrene to make one wall-mounted plant holder.

(5)

Answer £ .....

The edges of the frame and plant pot holders have been polished.

(d) Explain **two** benefits of polishing the edges of the frame and plant pot holders.

(6)

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(Total for Question 7 = 16 marks)

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8 Figure 15 shows a jewellery box in the form of a bear.

The jewellery box has four drawers.

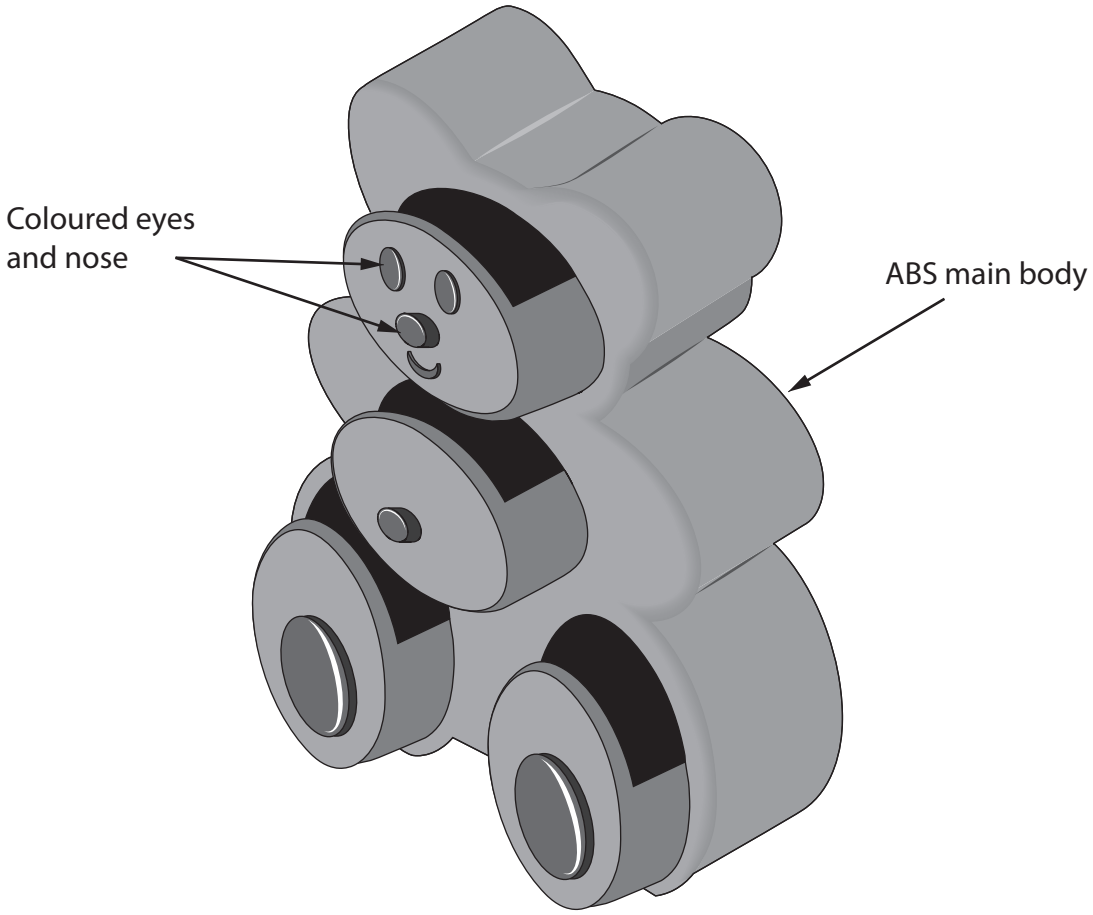

Figure 15

(a) Explain **one** physical characteristic of acrylonitrile butadiene styrene (ABS) that makes it an appropriate material from which to make the main body of the jewellery box.

(2)

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(b) Explain **one** issue associated with the ecological footprint of using ABS for the jewellery box.

(3)

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(c) Explain **two** reasons for manufacturing the features of the jewellery box to a tolerance.

(4)

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(d) The jewellery box is manufactured in the United Kingdom.

Figure 16 shows some additional information about the jewellery box.

Source of ABS	Europe
Country of manufacture	United Kingdom
Potential market	Craft fairs and online
Scale of production	Batch

Figure 16

Analyse the information in Figure 16.

Evaluate the jewellery box with reference to cost factors including:

- quality of material
- manufacturing processes
- treatments.

(9)

(Total for Question 8 = 18 marks)

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

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