

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** **1DT0/1A**

Design and Technology
COMPONENT 1: Metals

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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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.

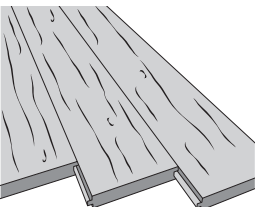
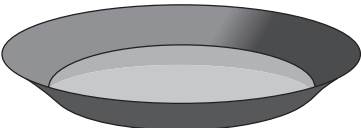
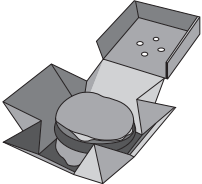
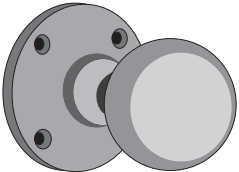
Picture of product	Material and product	Property
	Oak floorboards	Tough
	Wool gloves	(1) (i)
	Urea formaldehyde picnic plate	(1) (ii)
	Corrugated board takeaway burger box	(1) (iii)
	Brass door knob	(1) (iv)

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)

- (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.

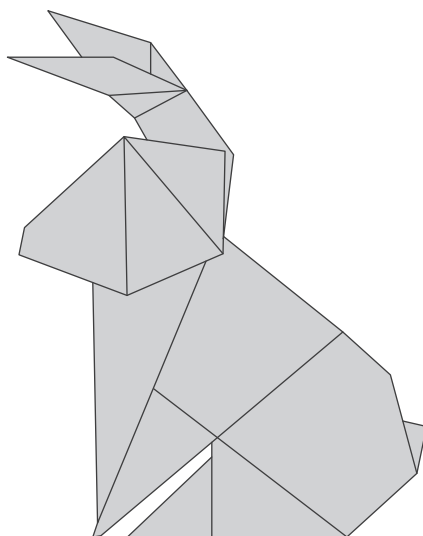


Figure 2

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

(1)

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

(2)

(c) Explain **one** way that shape-memory alloys (SMAs) can be used to animate a feature of the origami rabbit. (2)

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)

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

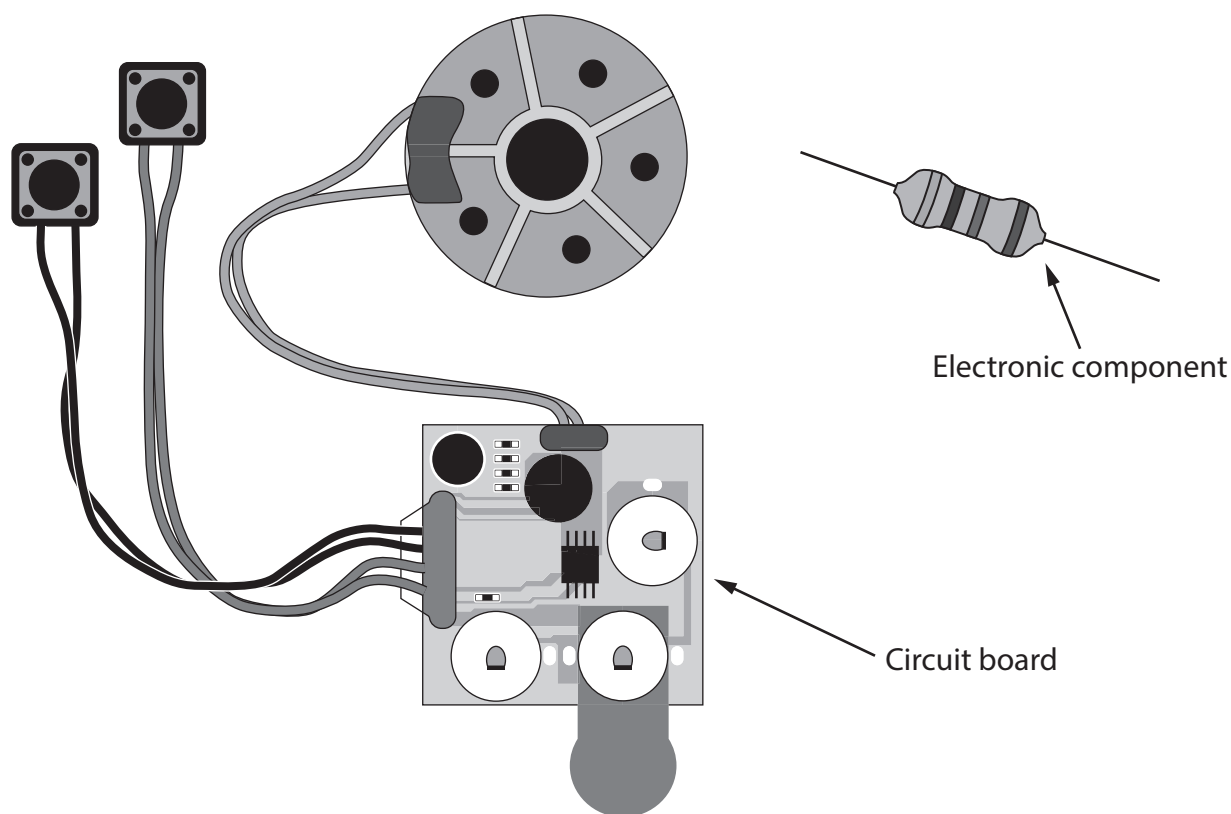


Figure 3

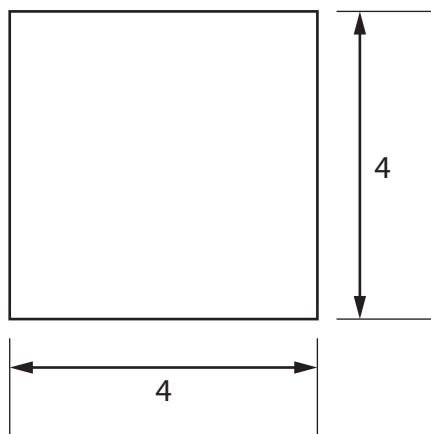
- (a) Name the specific type of electronic component shown in Figure 3.

(1)

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

(2)

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)



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).

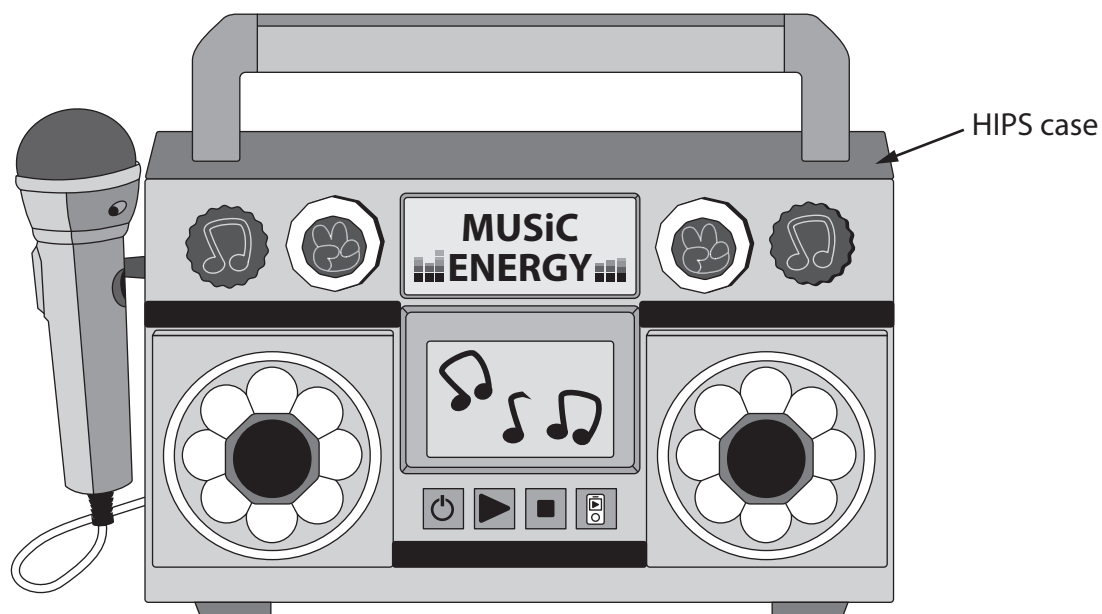


Figure 5

(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.

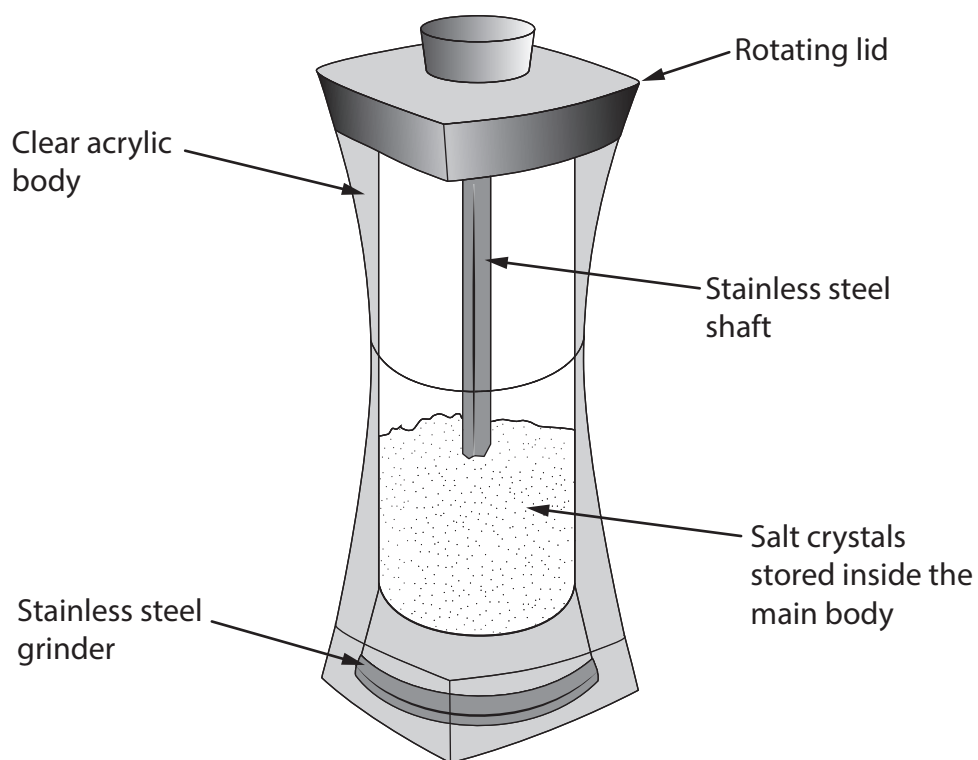


Figure 6

(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 SECTION A = 40 MARKS

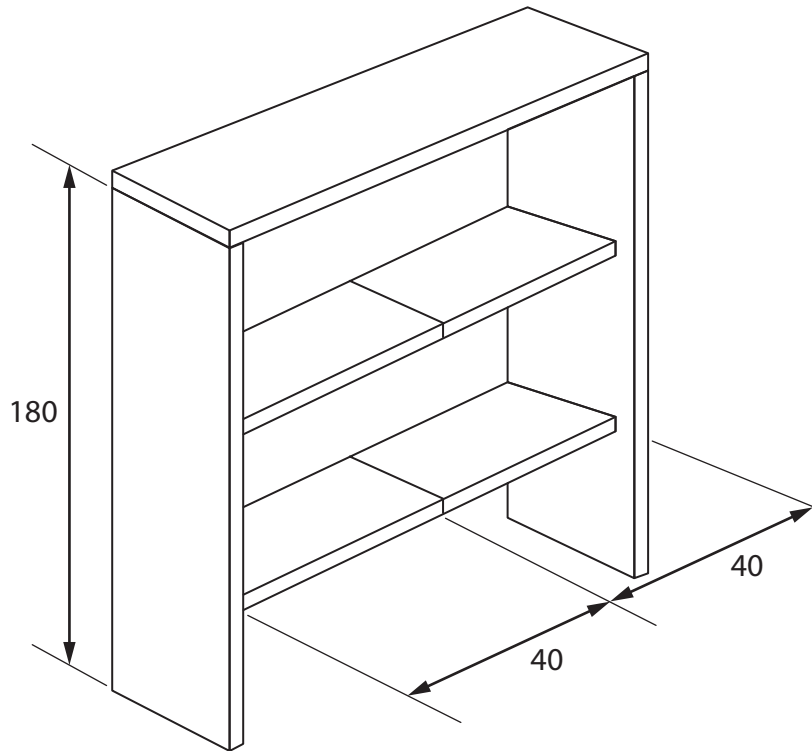


SECTION B

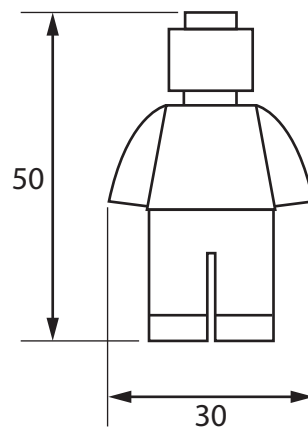
Metals

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

- 5 Figure 7 shows a design solution for a metal 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

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- (a) The metal 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:

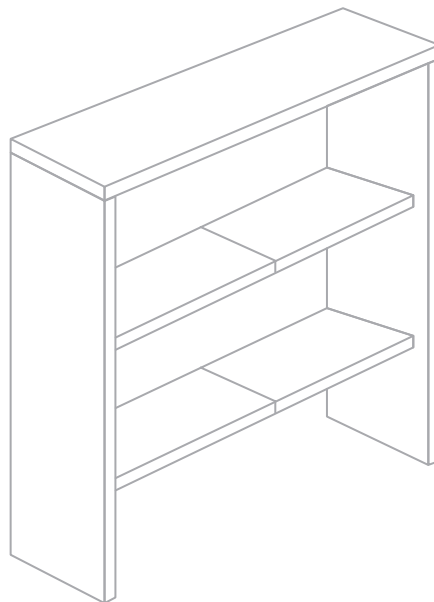
- be able to display an additional four collectable figures and include a method to stop them falling off the shelves
- include a method to stop the collectable figures from being stolen that still allows them to be seen
- be capable of being fixed to a wall and include a lighting system.

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.

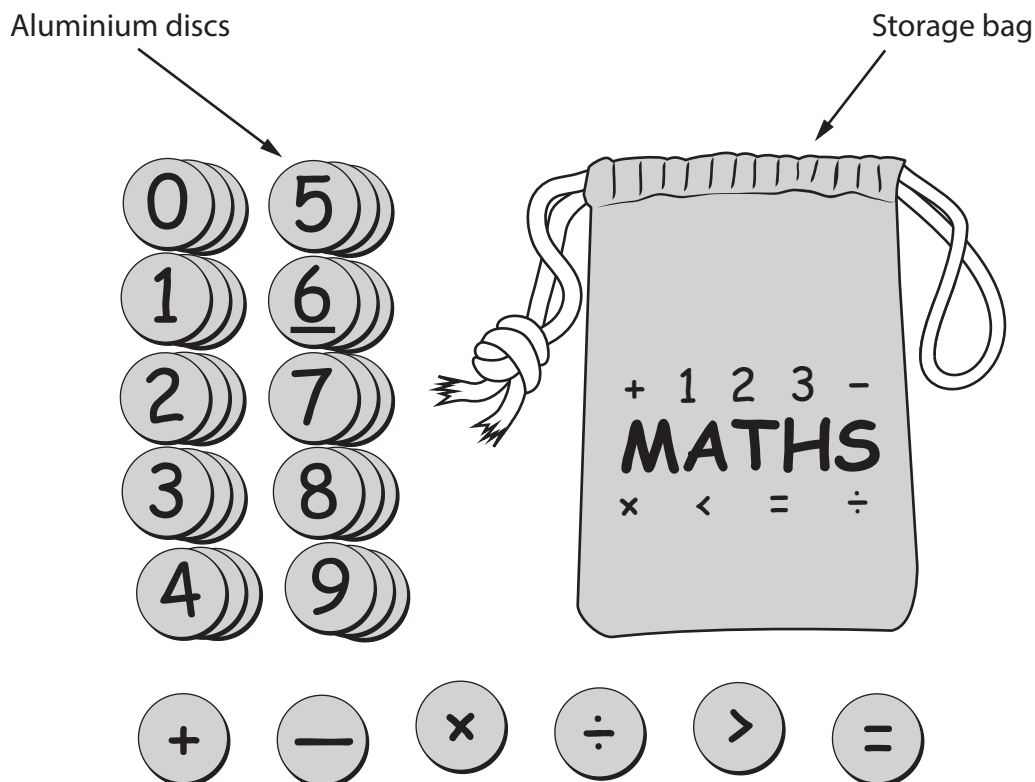


Figure 8

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)

6 Figure 9 shows a mild steel desk tidy.

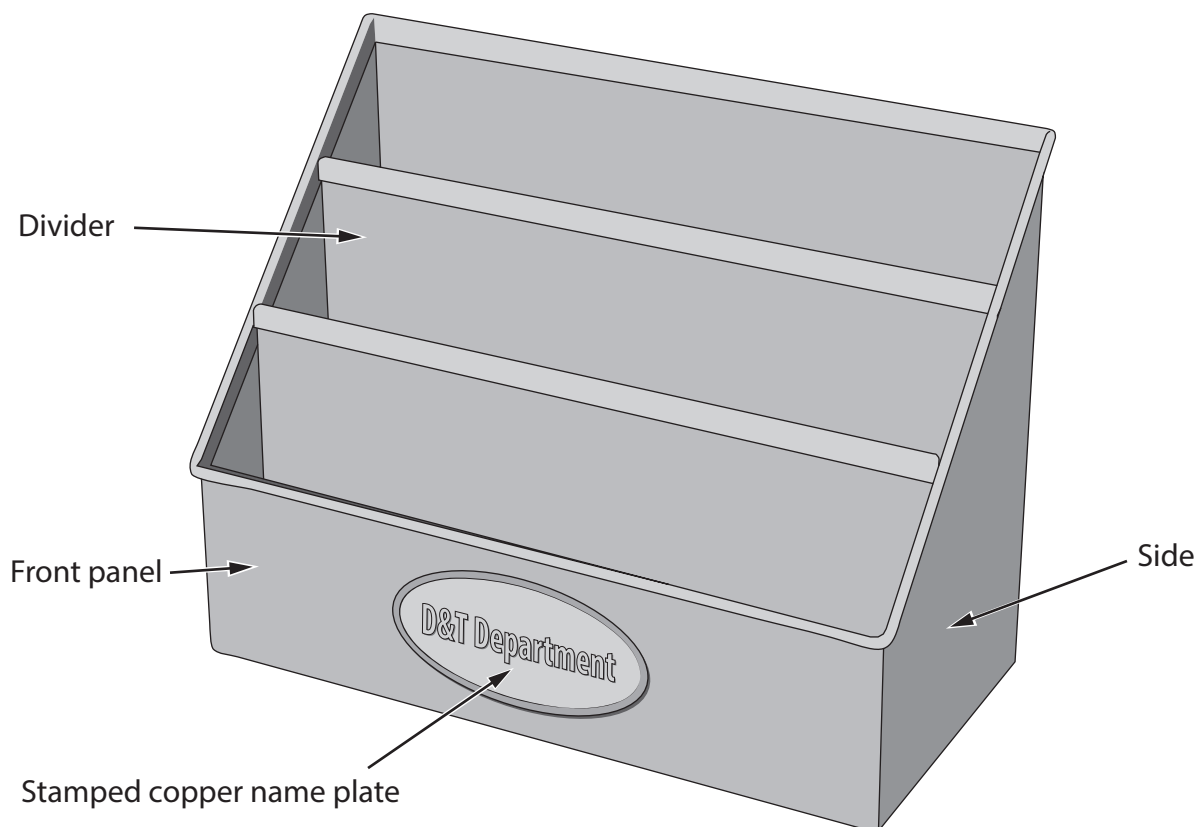


Figure 9

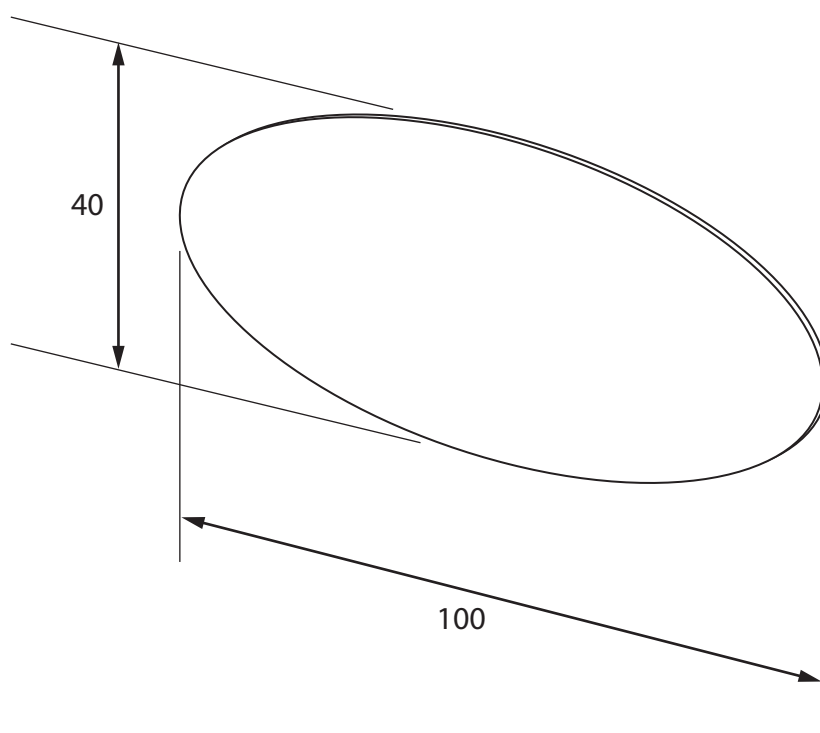
(a) Explain **two** reasons for using mild steel for the desk tidy.

(4)

1

2

- (b) Figure 10 shows a dimensioned drawing of a 0.8 mm piece of copper for the name plate before the lettering has been stamped on it.



All dimensions in mm

Figure 10

Use notes and sketches, in the space below, to show how the lettering would be marked out and stamped on the piece of copper using hand tools.

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

(4)

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(c) Explain **one** physical characteristic of copper that makes it an ideal material to use for the name plate.

(2)



Figure 11 shows the copper name plate ready to be joined to the front panel.

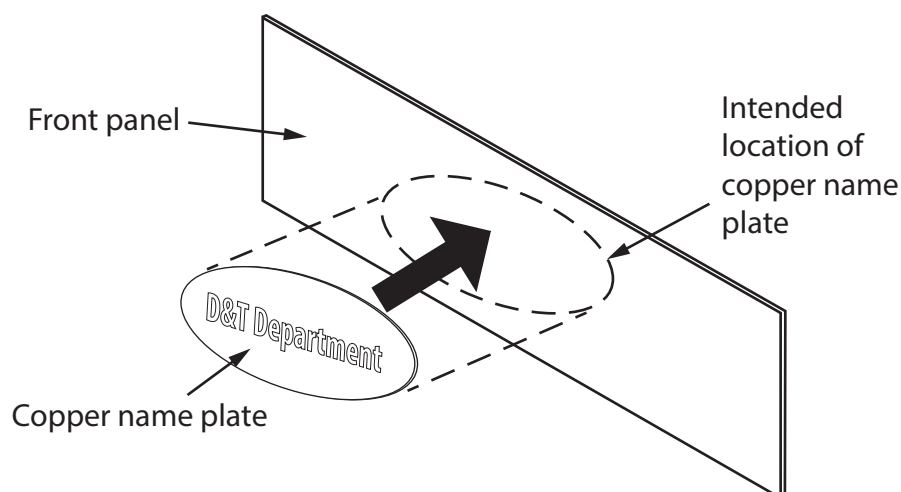


Figure 11

- (d) Give **two** different methods of assembly that could be used to join the copper name plate to the front panel as shown in Figure 11.

Explain **one** reason for using each method of assembly.

(6)

Method 1

Explanation

Method 2

Explanation

(Total for Question 6 = 16 marks)

- 7 Figure 12 shows a wall-mounted lamp and a saw that is used during its manufacture. The bracket has been manufactured from steel stock materials.

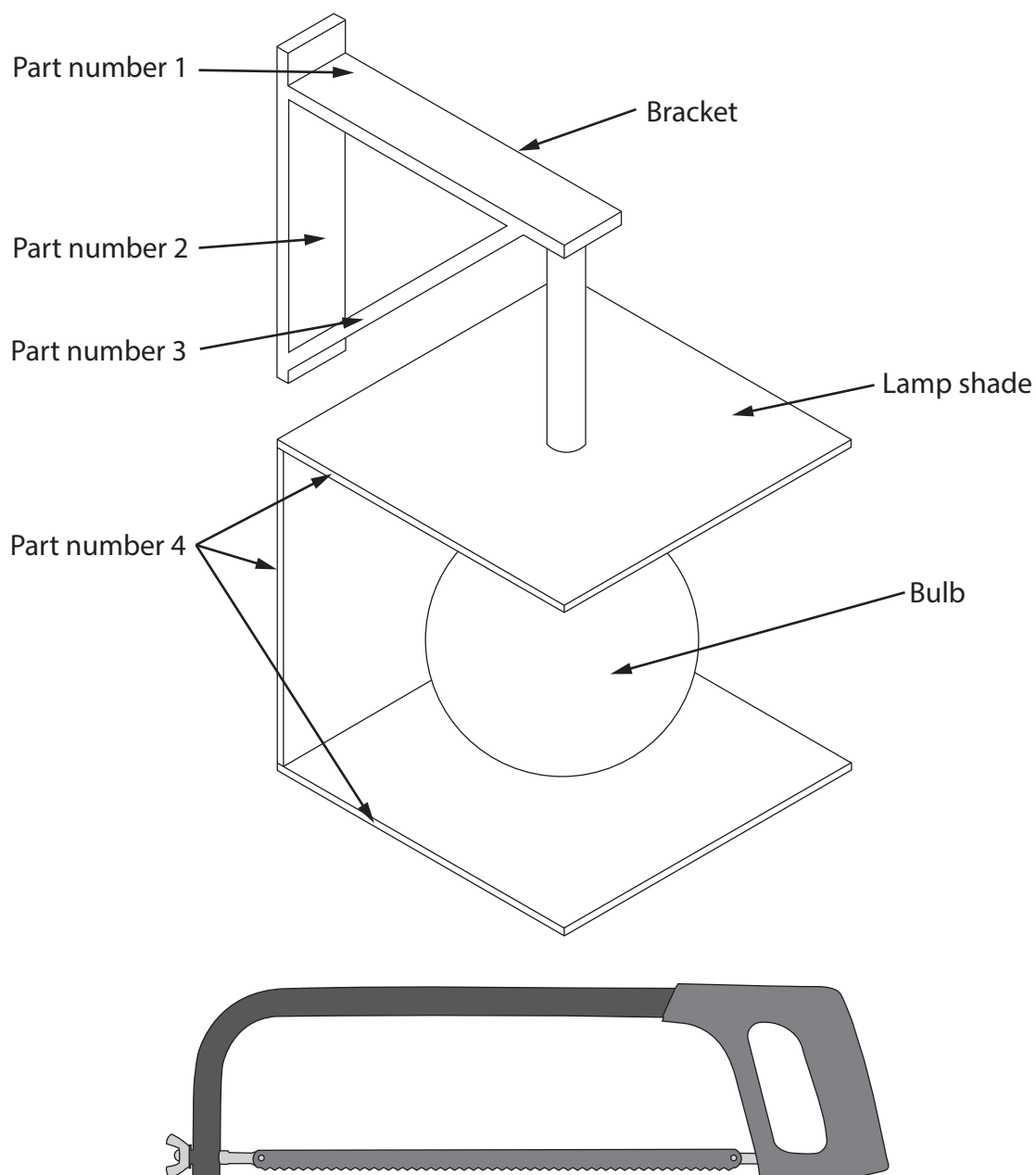


Figure 12

- (a) Name the specific type of saw shown in Figure 12.

(1)

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

(4)

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Figure 13 shows a table of steel parts required for the wall-mounted lamp.

Part number	Number required	Length	Width	Thickness
1	1	100	20	5
2	1	100	20	5
3	1	75	20	5
4	3	100	100	3

Figure 13

All dimensions in mm

The steel measuring 20×5 costs £2.80 per metre.

The steel measuring 100×3 costs £3.30 per metre.

(c) Calculate the total cost of the steel to make one wall-mounted lamp.

(5)

Answer £



The bracket has been finished with a powder coating.

- (d) Explain **two** benefits of using a powder coating to finish the surfaces of the bracket.

(6)

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(Total for Question 7 = 16 marks)



8 Figure 14 shows a toolbox.

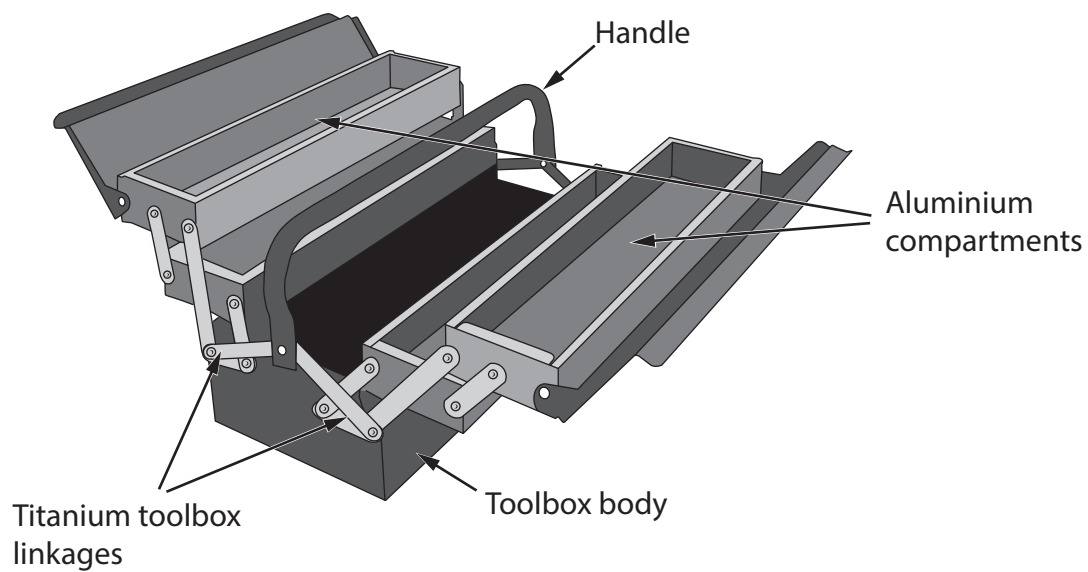


Figure 14

- (a) Explain **one** physical characteristic of aluminium that makes it an appropriate material from which to make the compartments of the toolbox.

(2)

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(b) Explain **one** issue associated with the ecological footprint of using titanium for the toolbox linkages.

(3)

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(c) Explain **two** reasons for manufacturing the parts of the toolbox to a tolerance.

(4)

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(d) The toolbox is manufactured in the United Kingdom.

Figure 15 shows some additional information about the toolbox.

Source of aluminium	France
Country of manufacture	United Kingdom
Potential market	DIY shops and online
Scale of production	Batch

Figure 15

Evaluate the tool box with reference to cost factors including:

- quality of material
- manufacturing processes
- commodity price on the London Metal Exchange.

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(Total for Question 8 = 18 marks)

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

