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 **1DT0/1D**

Design and Technology

COMPONENT 1: Systems

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.

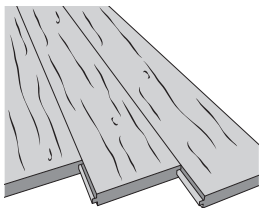
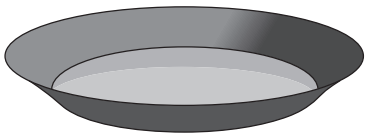
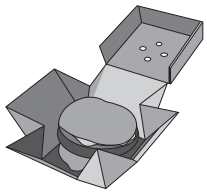
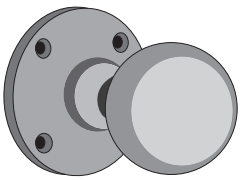
Picture of product	Material and product	Property
	Oak floorboards	Tough
	Wool gloves	**(1)** (i) .....
	Urea formaldehyde picnic plate	**(1)** (ii) .....
	Corrugated board takeaway burger box	**(1)** (iii) .....
	Brass door knob	**(1)** (iv) .....

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.

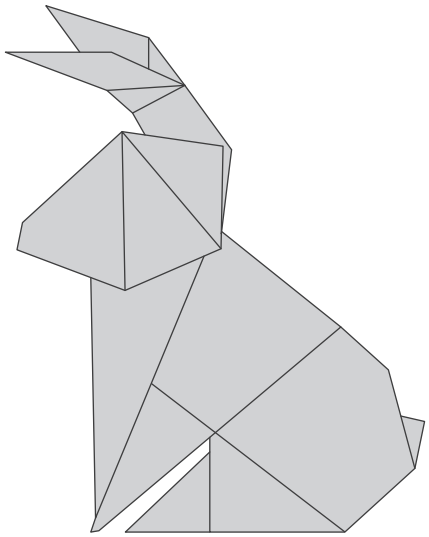

Figure 2

(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.

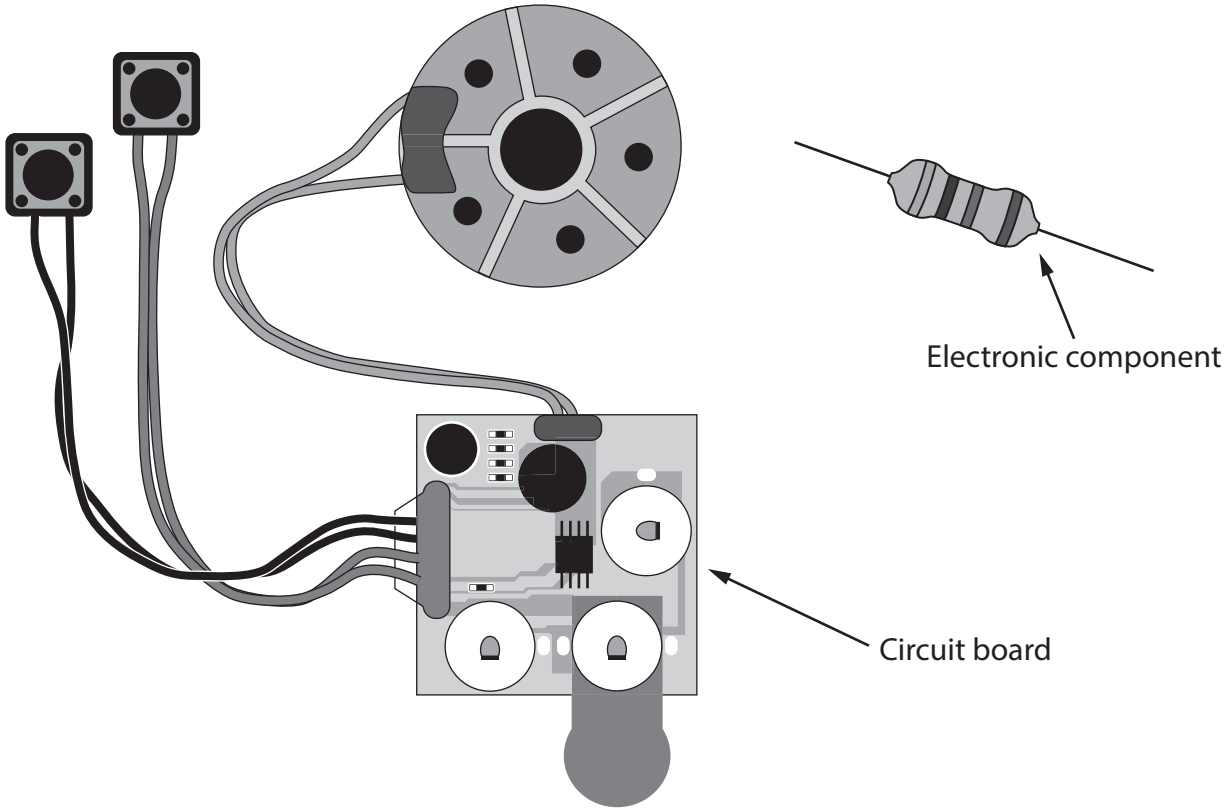

Figure 3

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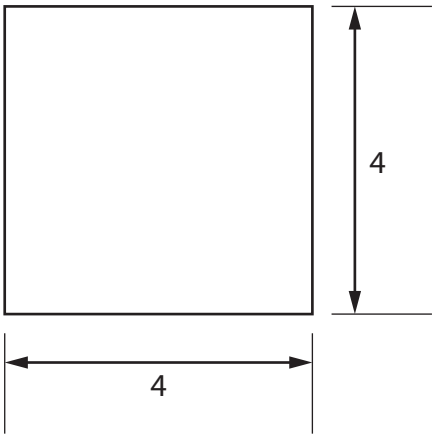
Figure 4 shows the dimensions of the circuit board that is used in the voice recorder.



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).

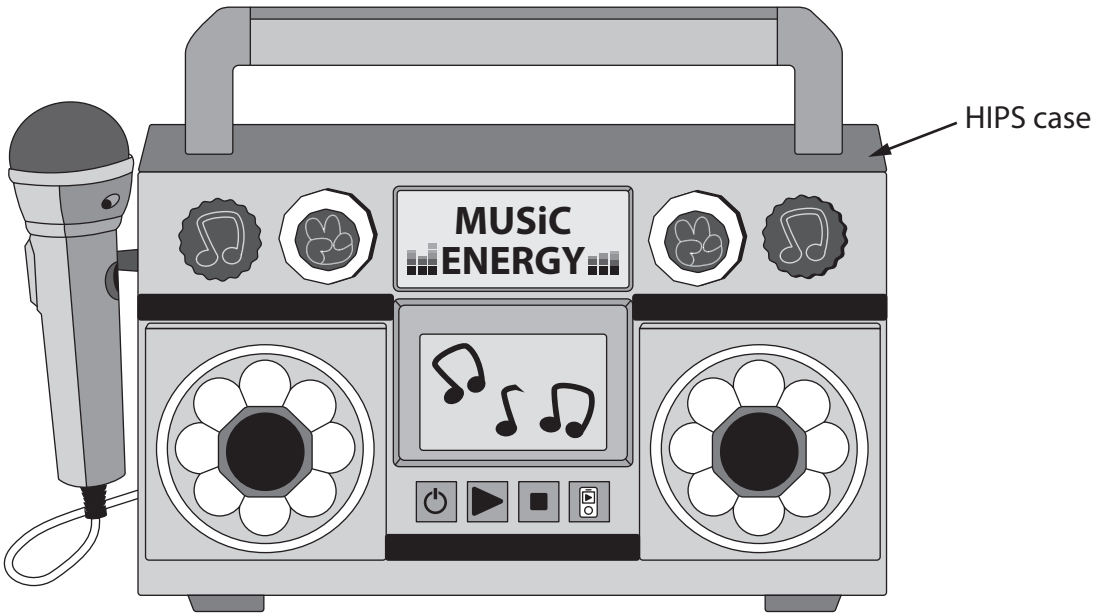

Figure 5

(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.

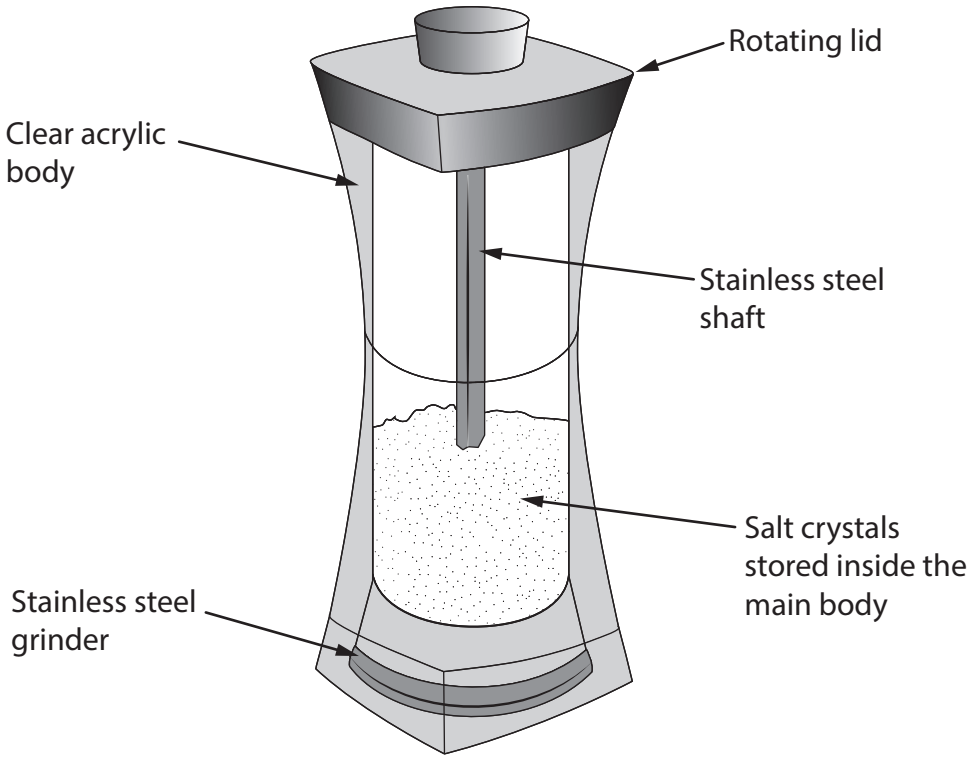

Figure 6

(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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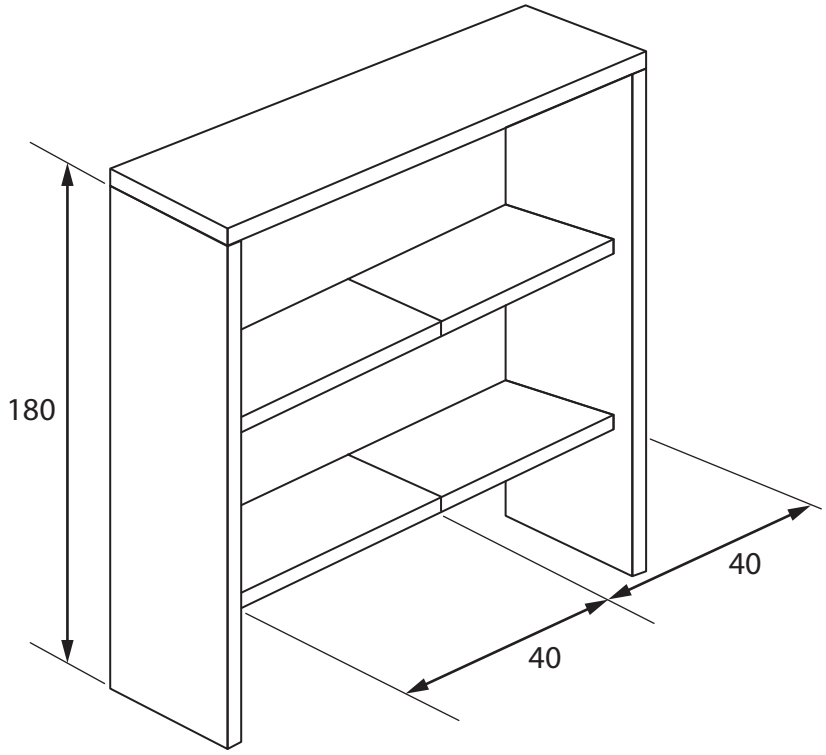
SECTION B

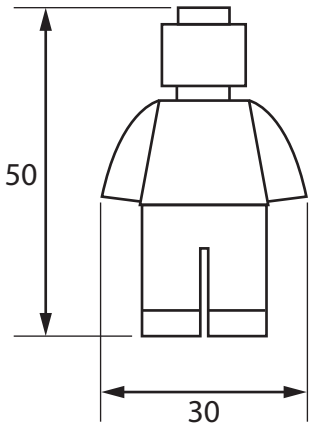
Systems

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

5 Figure 7 shows a design solution for a 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 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:

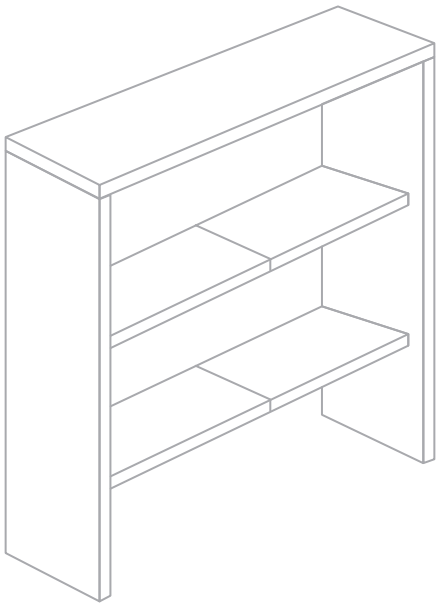
- be able to display an additional four collectable figures and include a method to stop them falling off the shelves
- be able to automatically rotate the collectable figures and include a method to stop them from being stolen
- be capable of being fixed to a wall and include a lighting system.

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 toy for a young child.

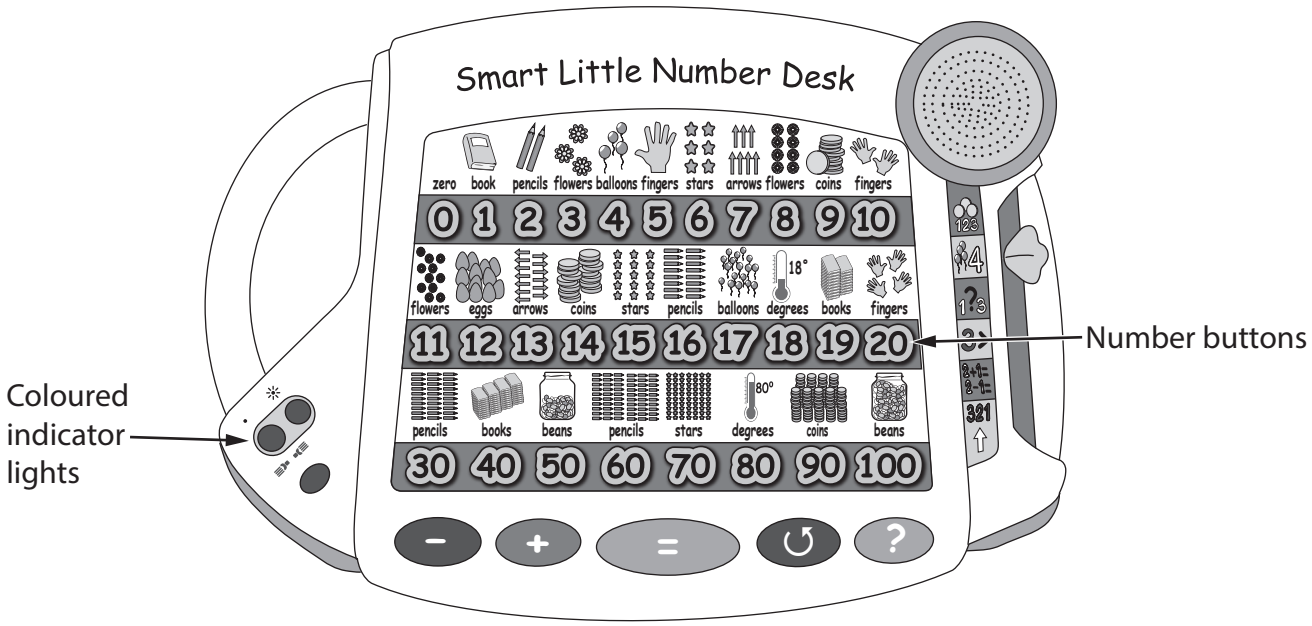


Figure 8

Explain **two** ways that the number play toy 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 a pressure sensor alarm system.

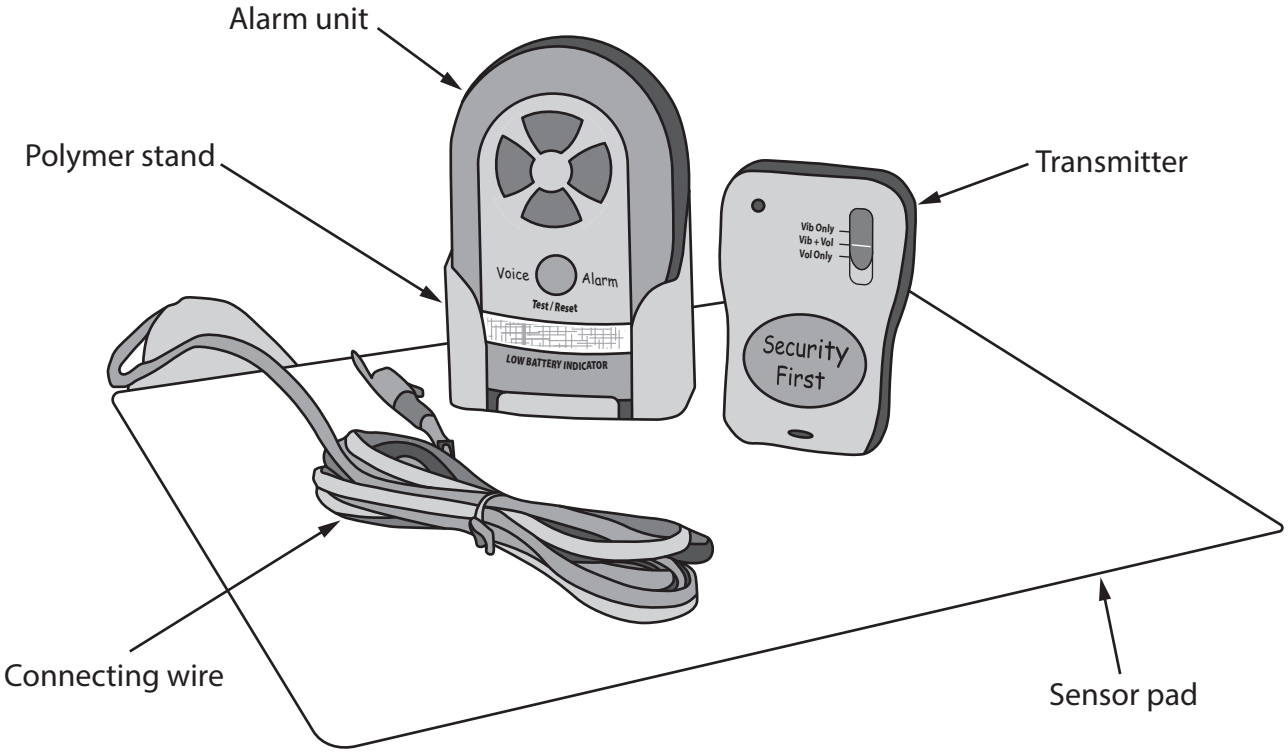

Figure 9

(a) Explain **two** reasons for using a loudspeaker in the alarm unit.

(4)

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(b) Figure 10 shows an image of a transistor that will be soldered to the circuit board for the alarm unit.

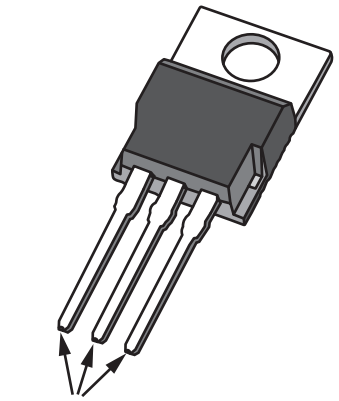

Figure 10

Use notes and sketches, in the space below, to show how the transistor legs would be mounted through pre-drilled holes and soldered to the circuit board.

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

(4)

Figure 11 shows part of a circuit board used in the alarm unit.

The tracks on the alarm unit circuit board are made from copper.

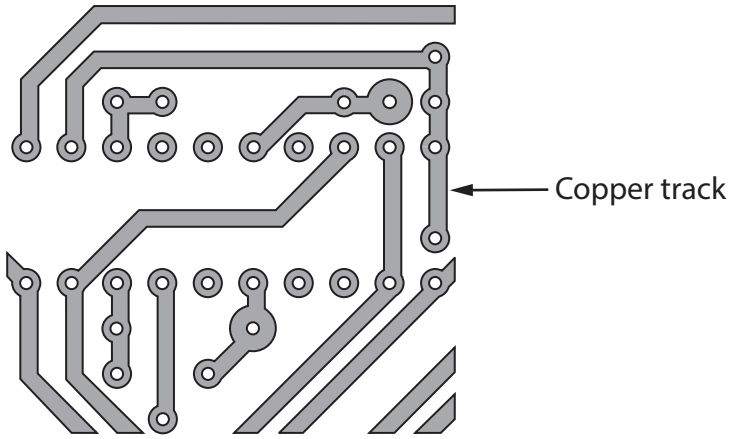

Figure 11

(c) Explain **one** property of copper that makes it an ideal material to use for the circuit board tracks.

(2)

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Figure 12 shows the polymer stand for the alarm unit.

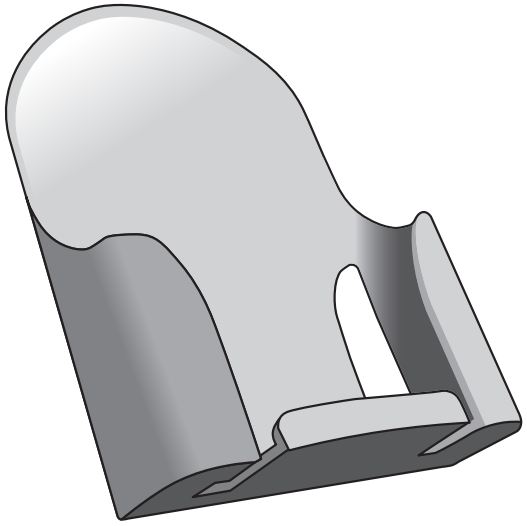

Figure 12

(d) Give **two** different methods that could be used to manufacture the polymer stand shown in Figure 12.

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

(6)

Method 1

Explanation

Method 2

Explanation

(Total for Question 6 = 16 marks)

7 Figure 13 shows a wall-mounted lamp and a hand tool that is used during the connection of wires to the bulb.

The bracket has been manufactured from steel stock materials.

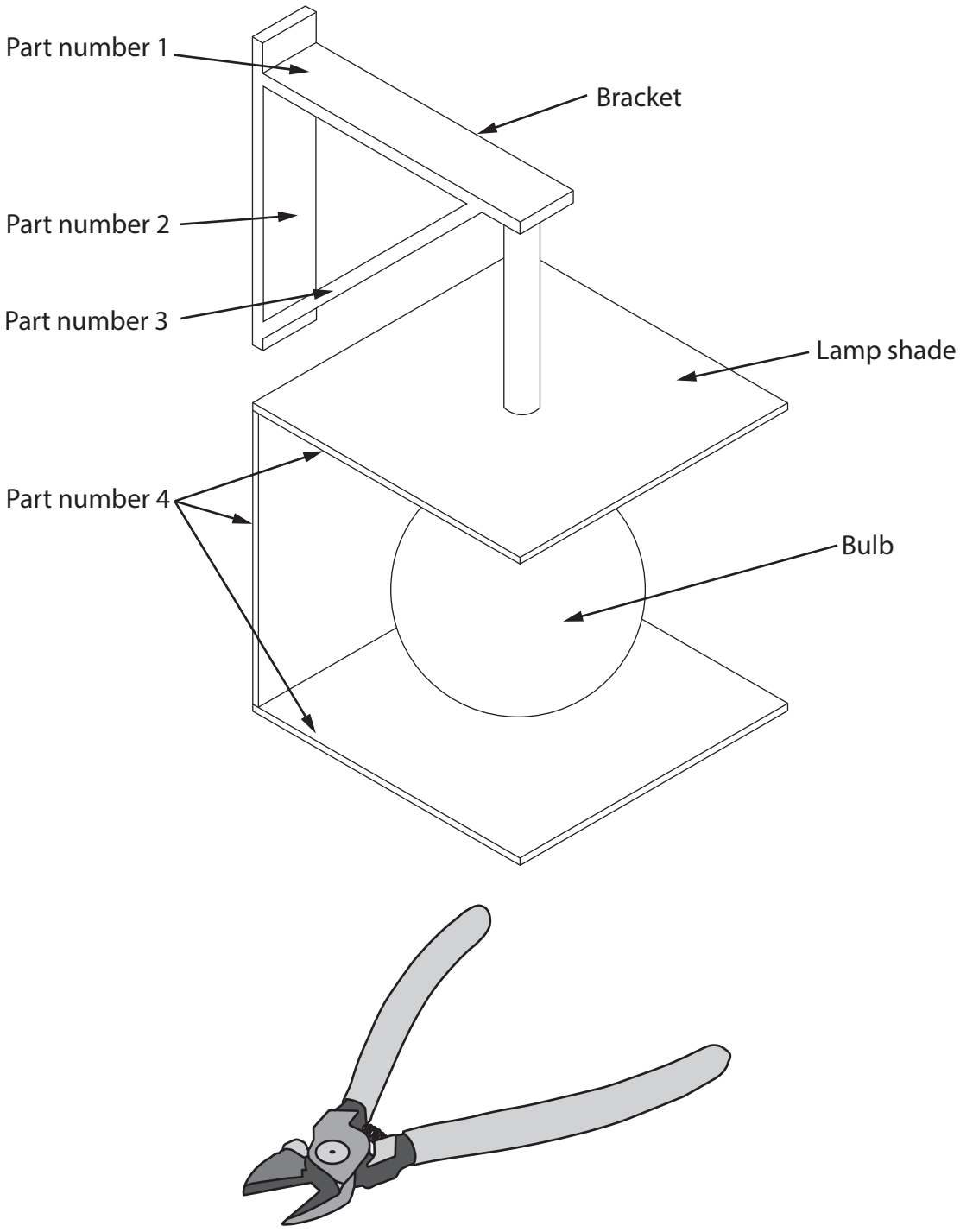

Figure 13

(a) Name the specific hand tool shown in Figure 13.

(1)

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(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 14 shows a table of 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 14

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 material to make one wall-mounted lamp.

(5)

Answer £ .....

Figure 15 shows some of the wire used in the lamp. The wire has an insulated coating.

Figure 15

(d) Explain **two** benefits of using an insulated coating for the wire.

(6)

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(Total for Question 7 = 16 marks)

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8 Figure 16 shows a desktop label printer and a cable that is supplied with the printer.

The cable has gold-plated printer cable connectors.

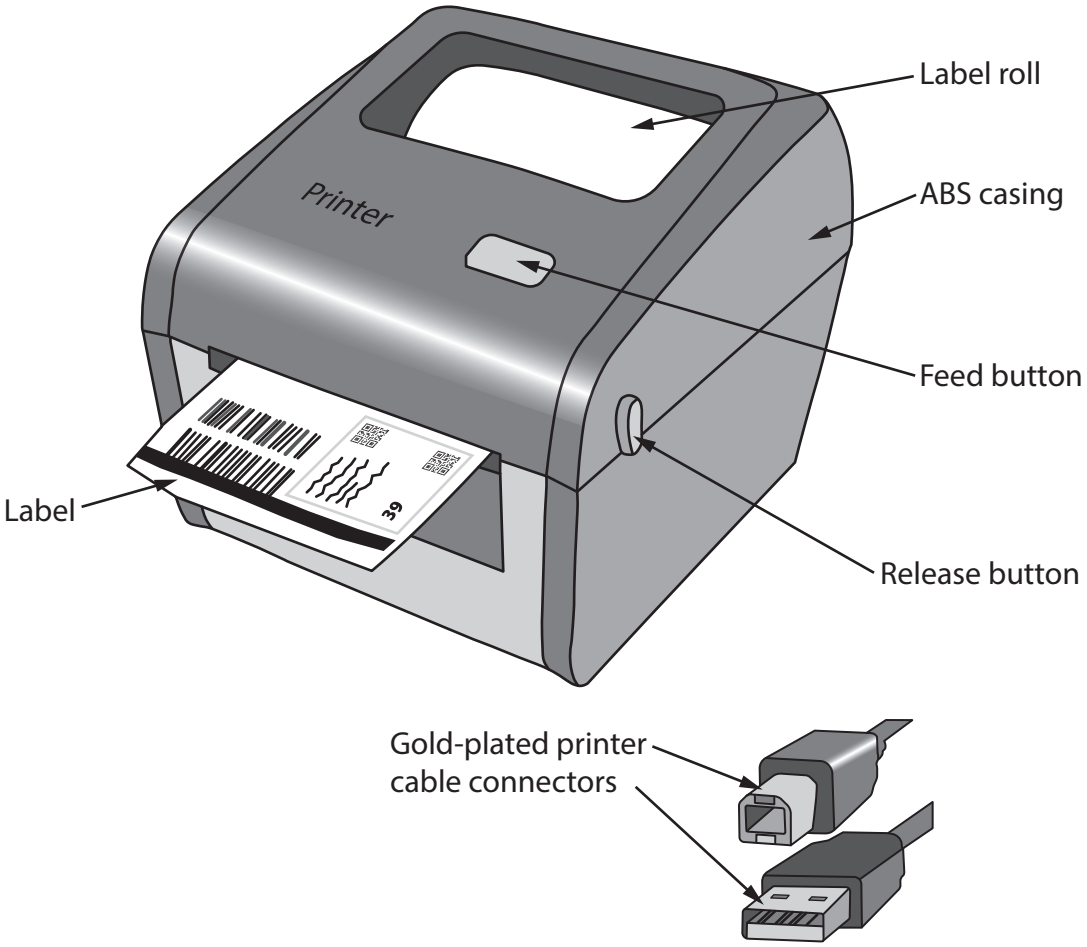

Figure 16

(a) Explain **one** working property of acrylonitrile butadiene styrene (ABS) that makes it an appropriate material to use for the case of the desktop label printer.

(2)

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(b) Explain **one** issue associated with the ecological footprint of using gold for the printer cable connectors.

(3)

(c) Explain **two** reasons for manufacturing the casing of the desktop label printer to a tolerance.

(4)

1

2

(d) The desktop label printer is manufactured in the United Kingdom.

Figure 17 shows some additional information about the desktop label printer.

Source of ABS	United States of America
Country of manufacture	United Kingdom
Potential market	Office suppliers and online
Scale of production	Batch

Figure 17

Analyse the information in Figure 17.

Evaluate the desktop label printer with reference to cost and environmental factors including:

- quality of components
- manufacturing processes
- the Waste Electrical and Electronic Equipment (WEEE) Directive.

(9)

(Total for Question 8 = 18 marks)

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

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