OCR
RECOGNISING ACHIEVEMENT

GCSE

DESIGN & TECHNOLOGY
INDUSTRIAL TECHNOLOGY

PAPER 2 (Higher Tier)

FRIDAY 25 MAY 2007

H

1959/2

Morning

Time: 1 hour 15 minutes

Candidate Name

Centre Number

Candidate Number

INSTRUCTIONS TO CANDIDATES

- Write your name, Centre number and Candidate number in the boxes above.
- Answer **all** the questions.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Do **not** write in the bar code.
- Do **not** write outside the box bordering each page.
- WRITE YOUR ANSWER TO EACH QUESTION IN THE SPACE PROVIDED. ANSWERS WRITTEN ELSEWHERE WILL NOT BE MARKED.

INFORMATION FOR CANDIDATES

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- All dimensions are in millimetres.
- Assume any mechanical system to be 100% efficient.

For Examiner's Use	
1	
2	
3	
4	
5	
Total	

This document consists of **14** printed pages and **2** blank pages.

1 Fig. 1 shows views of two litter bins.

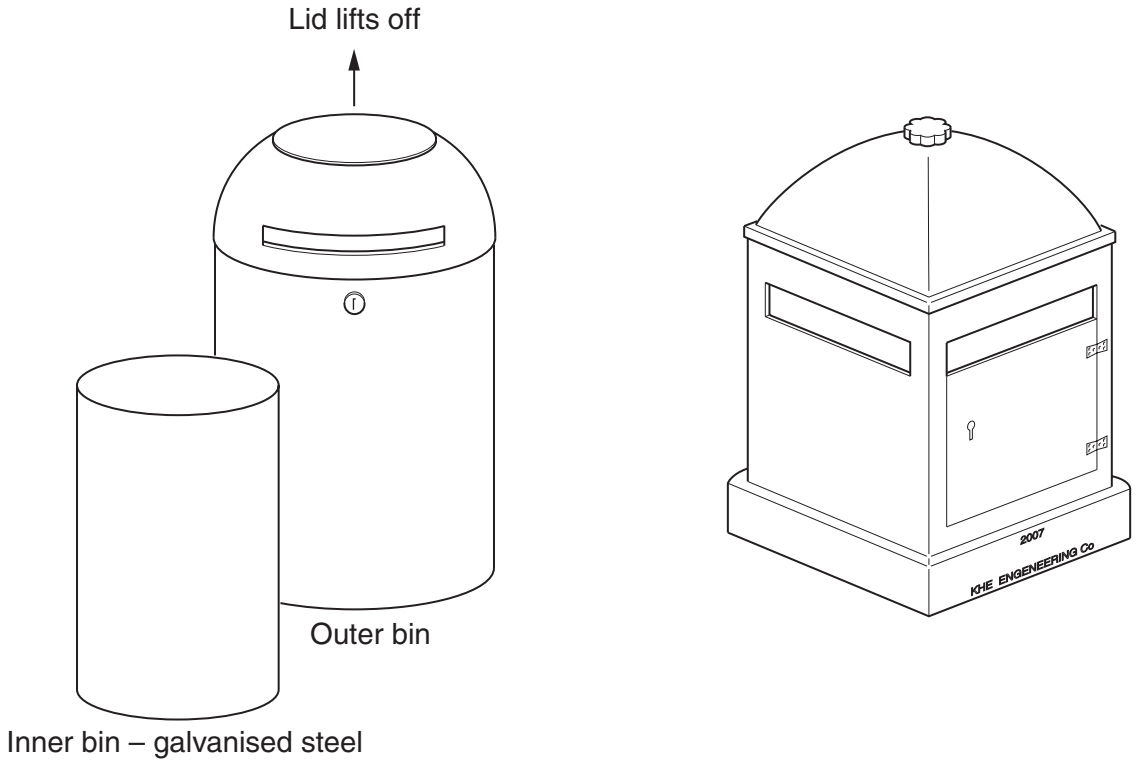


Fig. 1

(a) (i) State a suitable method of manufacture for litter bin **A**.

_____[1]

(ii) State a suitable method of manufacture for litter bin **B**.

_____[1]

(b) State a suitable finish for litter bin **B**.

_____[1]

(c) Give **one** benefit to the manufacturer when producing litter bin **A**.

_____[1]

(d) (i) Give **one** advantage in use of litter bin **A**.

_____[1]

(ii) Give **one** advantage in use of litter bin **B**.

_____[1]

(e) When emptying **litter bin A**, the inner bin was difficult to lift out.
Use sketches and notes to show modifications to the inner bin to make it easier to lift out. Include details of materials and construction.

[4]

[Total: 10]

2 Fig. 2 shows a clamp and bracket machined from aluminium alloy.

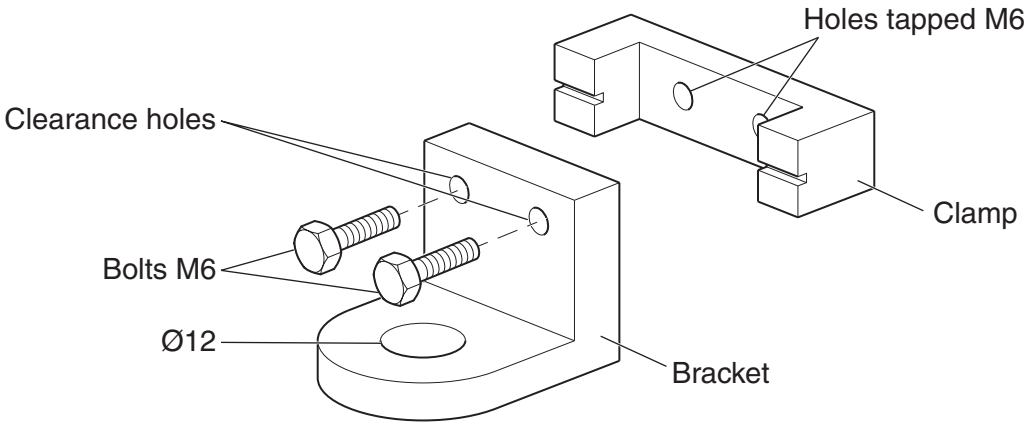


Fig. 2

Fig. 3 shows diagrams of each stage of manufacture. They **are not** shown in the correct order.

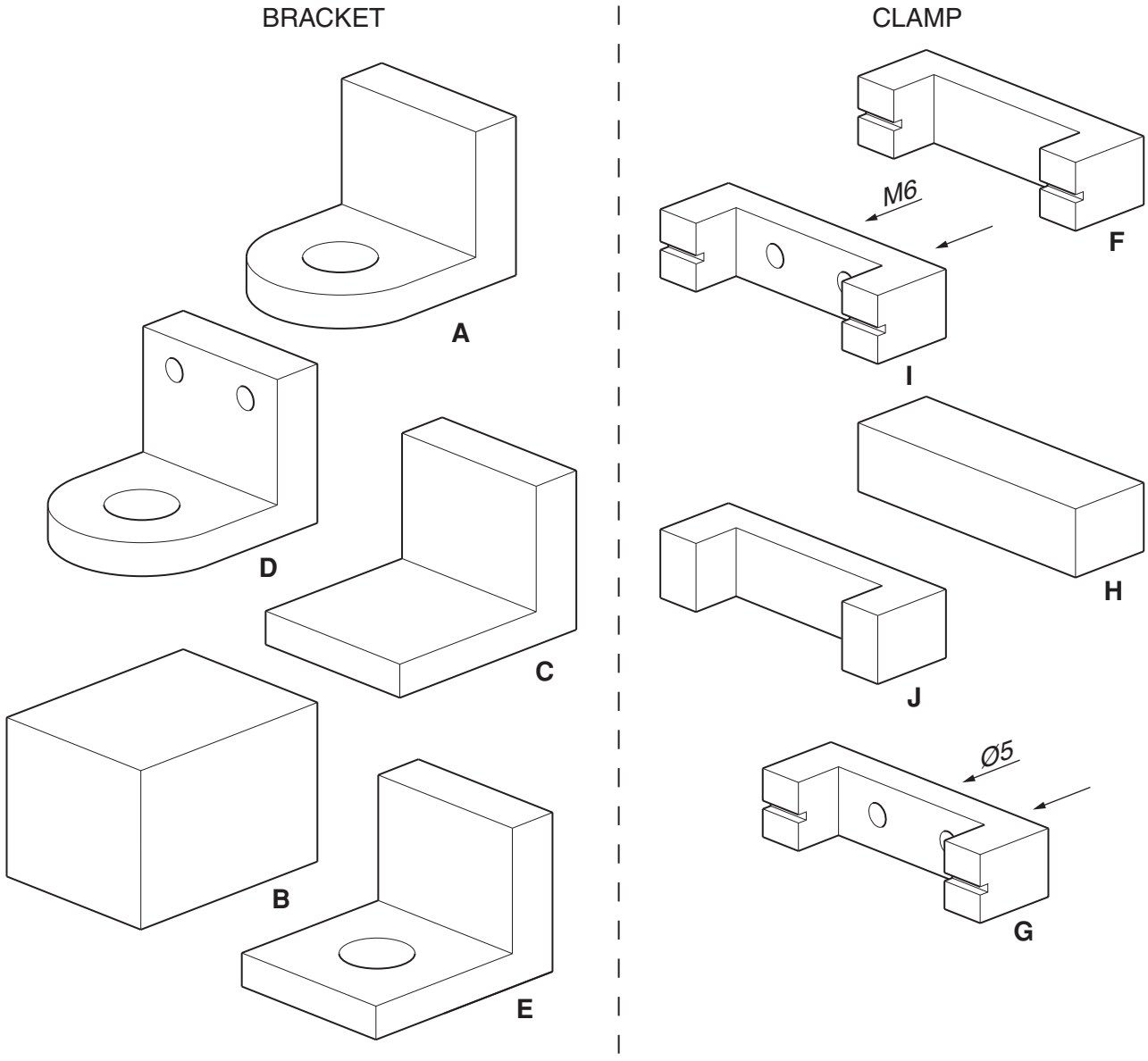
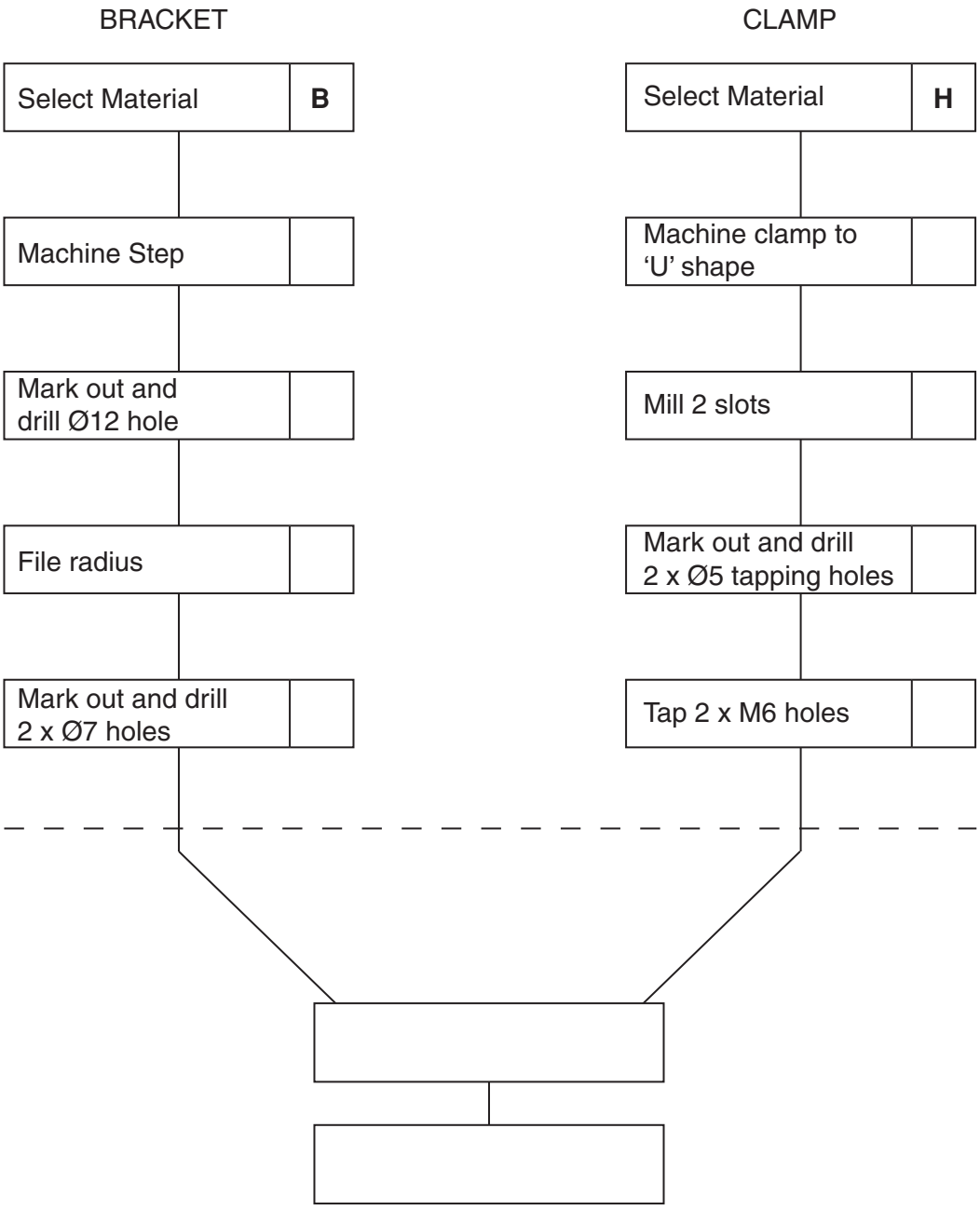


Fig. 3

Fig. 4 shows a diagram for the sequence of operations.

(a) Complete the sequence diagram by placing the stages in the correct order.



[8]

Fig. 4

(b) Complete the sequence diagram by adding **two** further stages. [2]

[Total: 10]

3 Fig. 5 shows a cup, a milk container and a stirring paddle, all made from plastic.

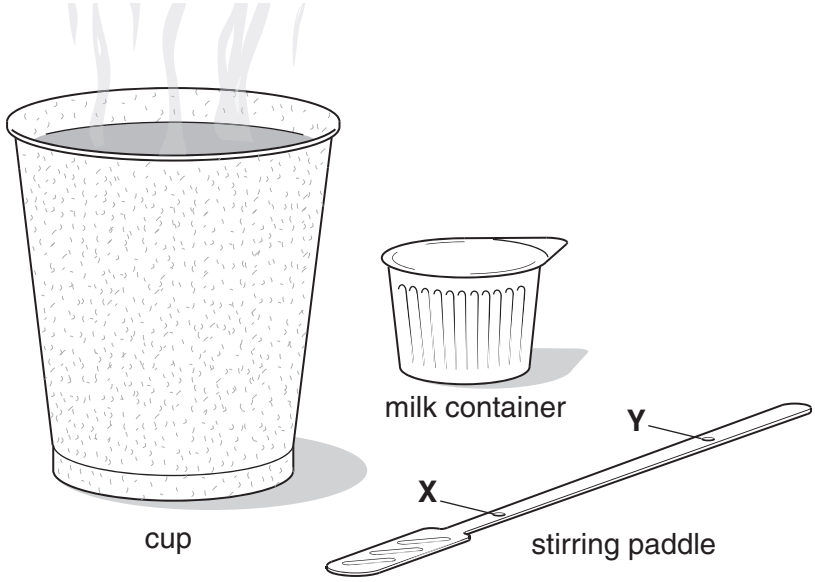


Fig. 5

(a) State a suitable method of manufacture for the milk container.

_____[1]

(b) Give **one** manufacturing reason for the tapered shape of the milk container.

_____[1]

(c) Give **one** reason for the fluting on the milk container.

_____[1]

(d) Give **one** reason why the drinking cup has a textured surface.

_____[1]

(e) On the stirring paddle there are two circular marks **X** and **Y**.

Explain how they occur during the manufacturing process.

_____

_____

_____[2]

Fig. 6 shows the underside of the milk container.

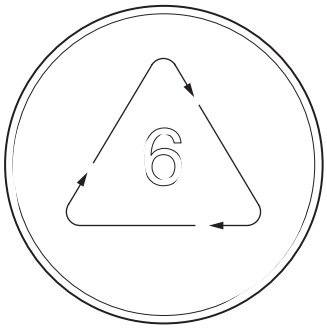


Fig. 6

(f) Explain what the mark means.

_____

_____

_____[2]

Fig. 7 shows where the stirring paddle often breaks in use.

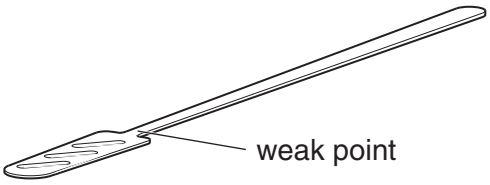


Fig. 7

(g) Use sketches and notes to show how the design could be strengthened.

[2]

[Total: 10]

4 Fig. 8 shows views of a prototype device to extrude modelling clay. It will be used by young children.

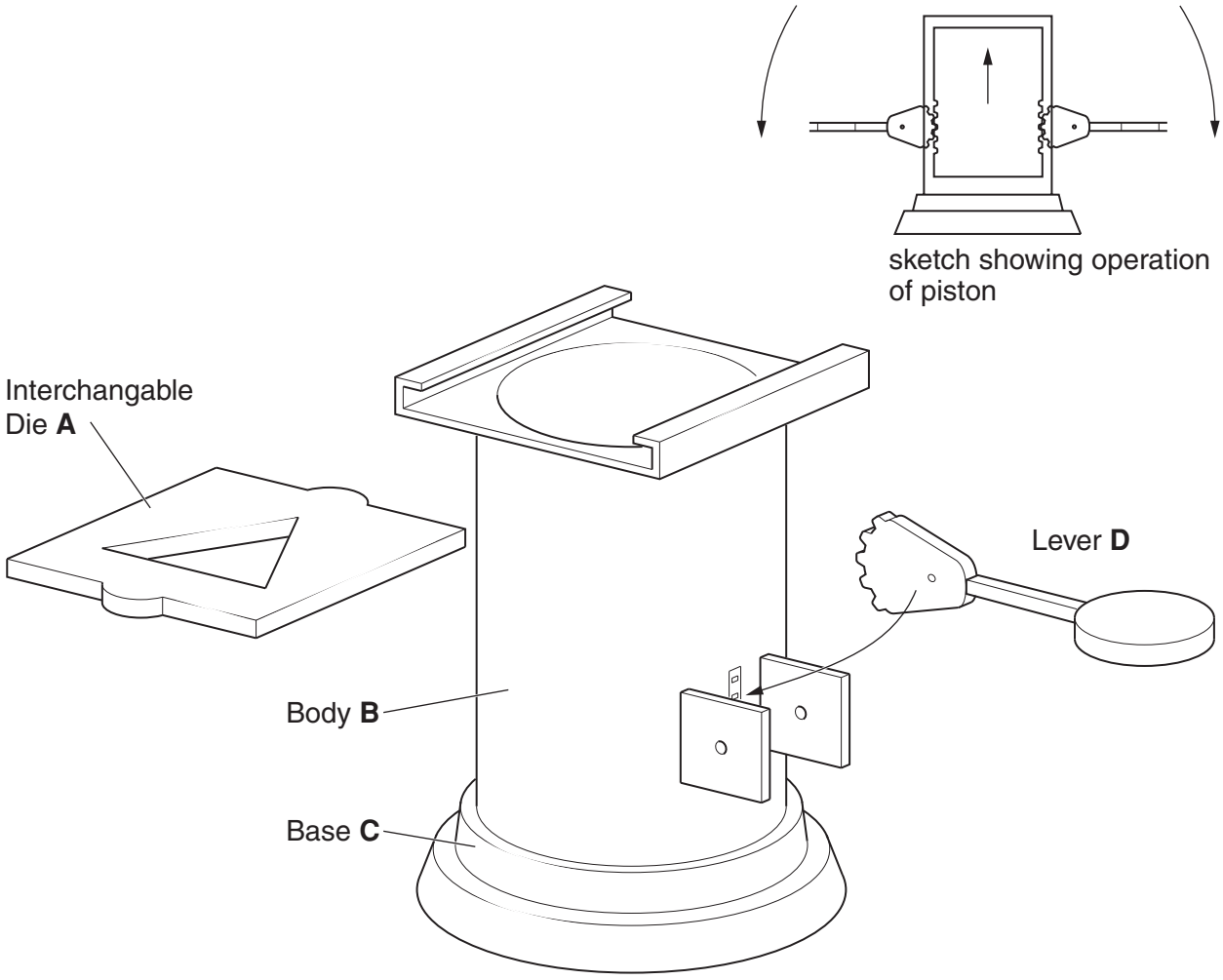


Fig. 8

The base **C** will be sand cast from aluminium alloy.

(a) Using sketches and notes, show a cross section of the pattern needed and its key features.

[4]

(b) Fig. 9 shows a drawing of the interchangeable die **A**.

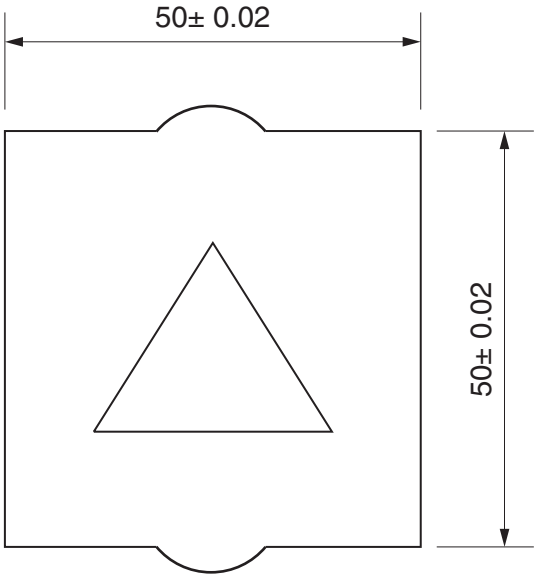


Fig. 9

Explain what the information 50 ± 0.02 means to an engineer.

_____

_____

_____[2]

(c) Fig 10 shows details of one of the fixing points for the lever **D**. The lever is to be held with a specially made pin and Nyloc nut.

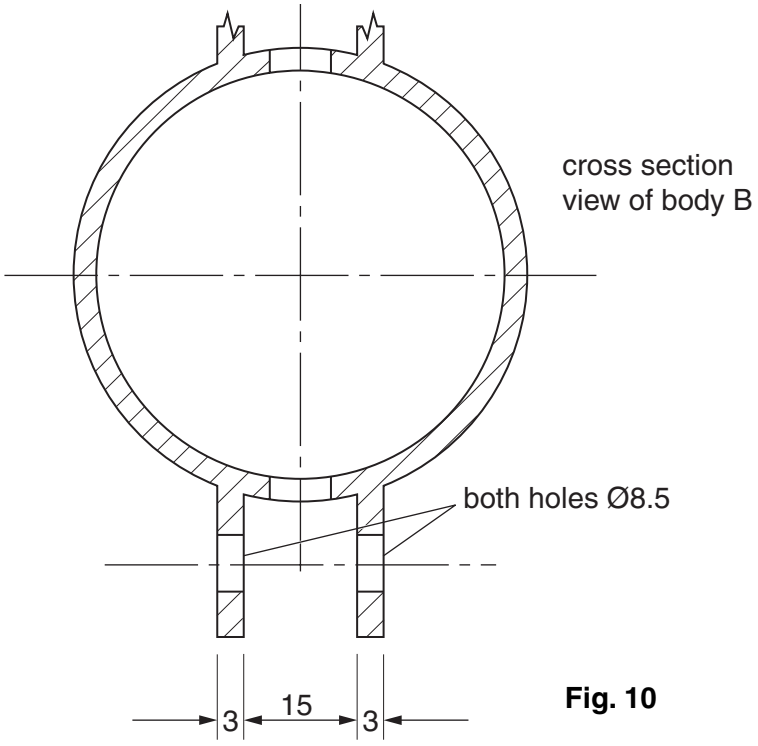


Fig. 10

In the space below design a suitable pin showing **all dimensions**

[4]

[Total: 10]

5 Fig. 11 shows a decorative paper punch with two separate punch designs.

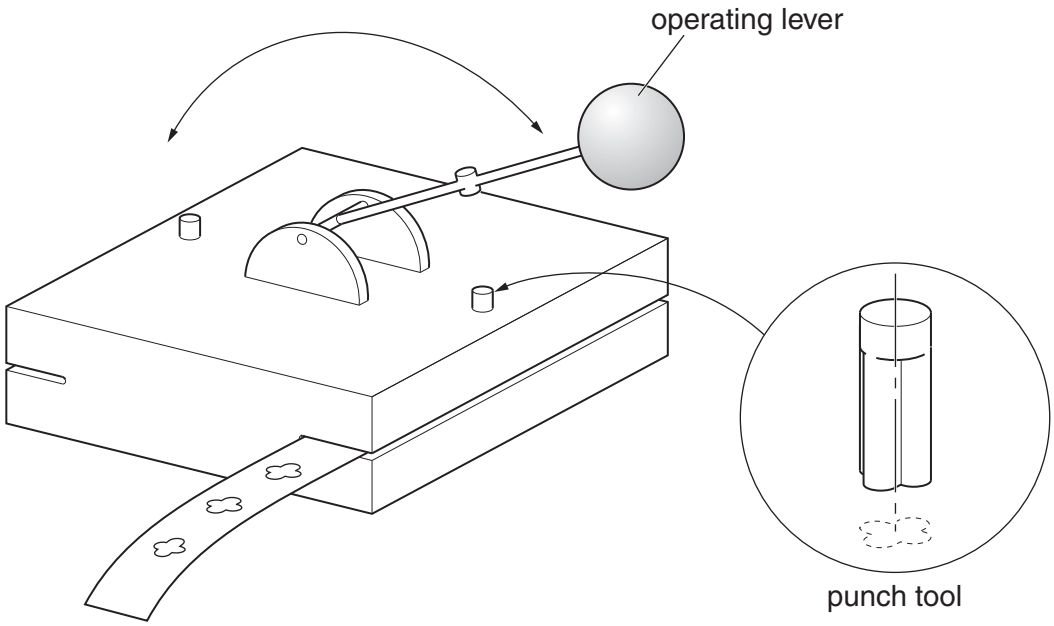


Fig. 11

(a) Give **two** ergonomic considerations in the design of the decorative paper punch.

_____

_____[2]

(b) The punch tool is made from mild steel. During testing it was found that the punch tool became blunt.

Name and describe a process that could be applied to the mild steel to improve its hardness.

_____

_____

_____

_____[3]

(c) Fig 12 shows an incomplete design for an improved decorative paper punch.

The improved design includes four different punch tools.

Use detailed sketches and notes to show how the operating lever assembly can:

- move to each punch tool position;
- locate accurately in each position.

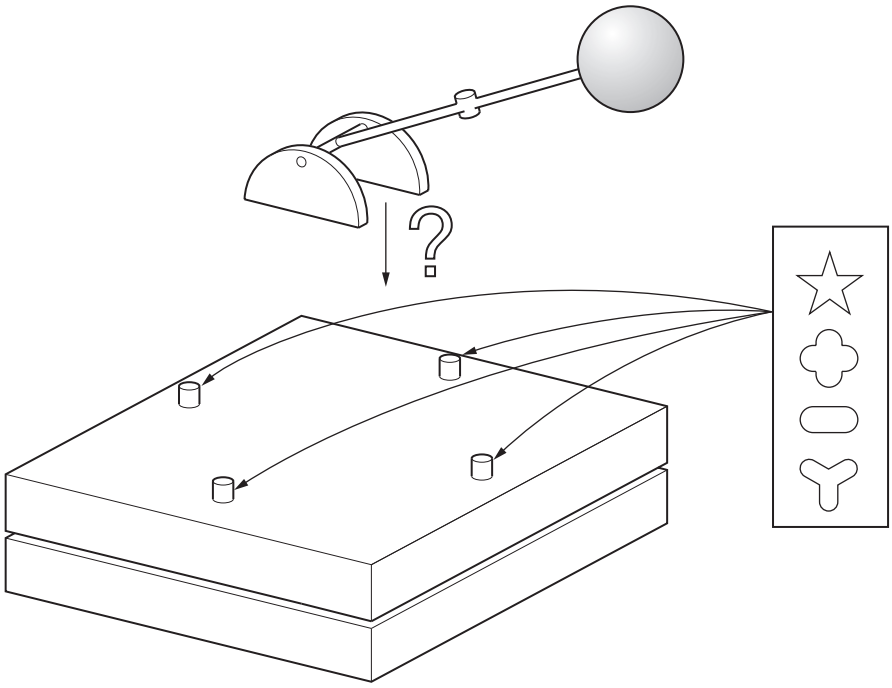


Fig. 12

Use this page for answers to part **(c)**.

[5]

[Total: 10]

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