

CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education Ordinary Level

DESIGN AND TECHNOLOGY

6043/01

Paper 1 Technology

October/November 2003

2 hours 30 minutes

Additional Materials: Answer Booklet/Paper
Plain paper
Sketching equipment

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.
Write in dark blue or black pen on both sides of the paper.
You may use a soft pencil for any diagrams, graphs or rough working.
Do not use staples, paper clips, highlighters, glue or correction fluid.

Part A

Answer **all** questions

Part B

Answer **four** questions.

Answer **one** question from Section 1, **two** questions from Section 2, and **one** other question from either Section.

At the end of the examination, fasten all your work securely together.

The number of marks is given in brackets [] at the end of each question or part question.

Use sketches where appropriate to help answer any question.

You are advised to spend no longer than 45 minutes on Part A and 1 hour 45 minutes on Part B.

Part A

You are advised to spend no more than 45 minutes on this part.

Attempt **all** questions.

1 State the effect water would have on the following, unprotected materials:

(a) mild steel;

(b) pine.

[2]

2 Sketch the following joining devices:

(a) hexagonal bolt;

(b) snap or round head rivet.

[4]

3 Fig. 1 shows a plastic comb.

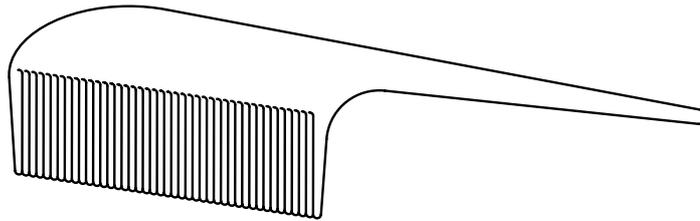


Fig. 1

(a) Name a suitable plastic to make the comb and give **one** reason for your choice.

(b) What is the purpose of a **mould** when making the comb?

[4]

4 State **three** safety precautions you would take when turning a piece of wood on a lathe.

[3]

5 Explain what is meant by the term 'modifications' when applied to a design project.

[2]

6 Sketch an item commonly made from expanded polystyrene.

[2]

- 7 Fig. 2 shows a shelf to be used for heavy items. Explain why chipboard is not suitable.

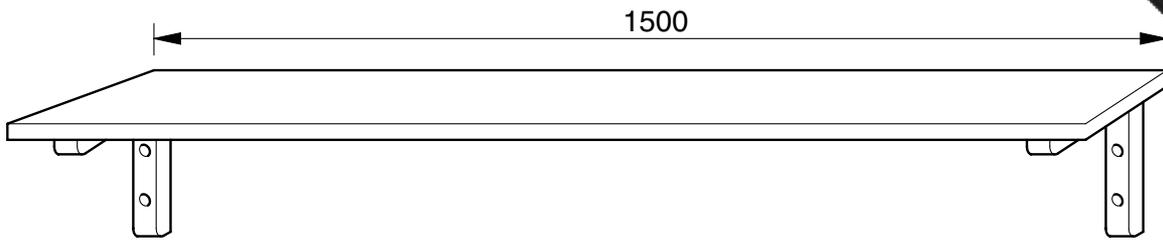


Fig. 2

[2]

- 8 Fig. 3 shows a tool used for marking out metals. Name the tool and describe how it would be set and used.

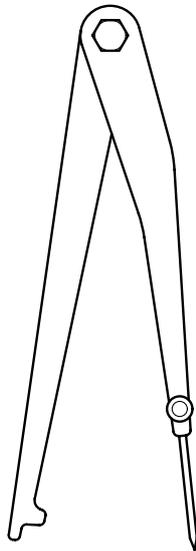


Fig. 3

[3]

- 9 Give **two** examples of how plastics can be used to protect other materials.

[2]

- 10 Sketch a butt hinge and give **one** example of its use.

[3]

Part B

You are advised to spend at least 1 hour 45 minutes on this part of the examination.

Answer **four** questions including **one** from Section 1, **two** from Section 2 and **one** further question from either section.

Section 1 – Tools and Materials

- 11 (a) Copy and complete the table given below to include a special property and **one** use for each of the six materials.

Material	Special Property	Use
Polythene		
Mahogany		
High carbon steel		
Epoxy resin		
Lead		
Plywood		

[12]

- (b) Describe **three** simple tests that can be used to help identify materials in a workshop.

[5]

12 Fig. 4 shows sketches of three tools used in the workshop.

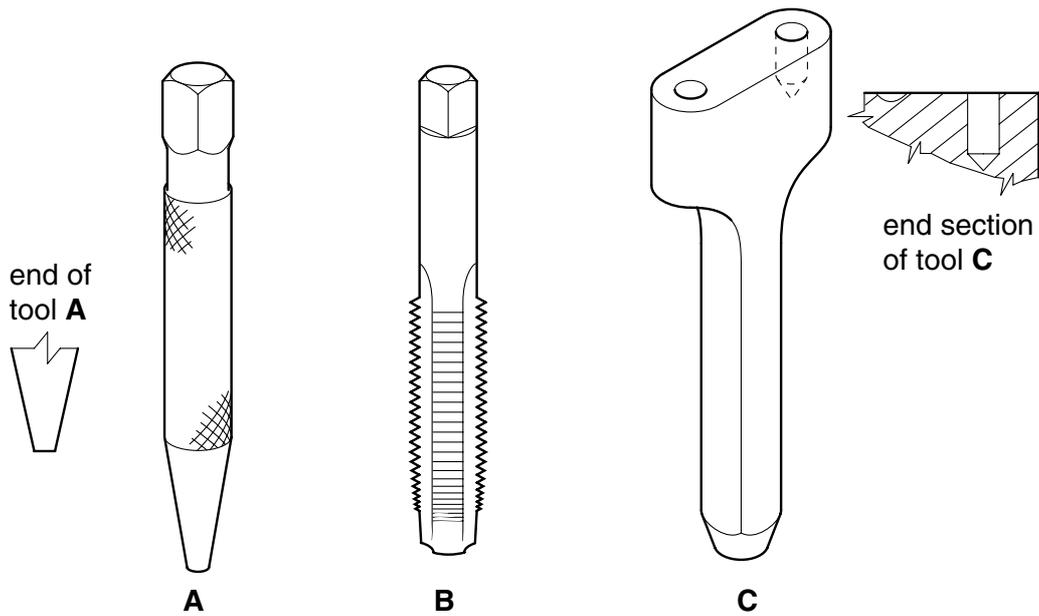


Fig. 4

- (a) Identify each tool shown in Fig. 4 and state its purpose. [6]
- (b) Explain:
- (i) why tool **A** has a knurled body;
 - (ii) why tool **B** has a square top;
 - (iii) why tool **C** has two differing holes at its end. [6]
- (c) For **one** of the tools shown in Fig. 4, sketch another tool that would be used with it **and** explain how they work together. [5]

13 The design for a Christmas tree decoration is given in Fig. 5.

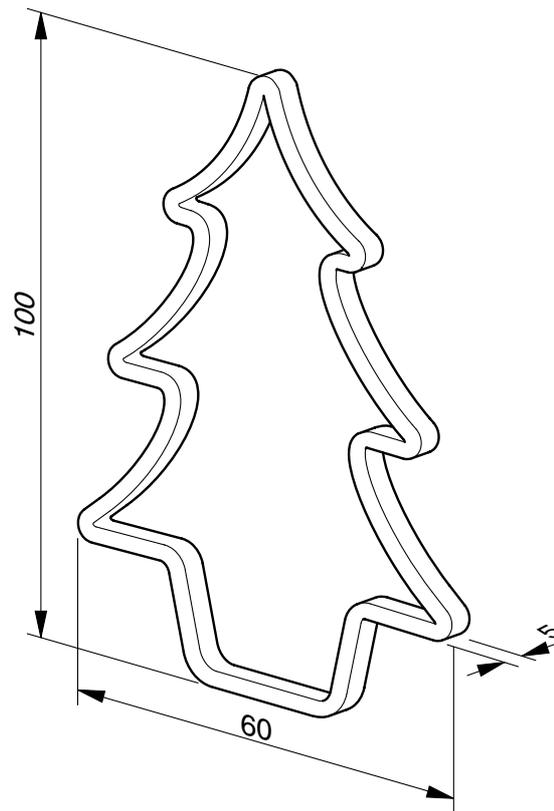


Fig. 5

(a) State **two** safety considerations when choosing any material for such a tree decoration. [2]

(b) The following **sheet** materials could be used to make the tree decoration:

- (i) Copper;
- (ii) MDF;
- (iii) Acrylic.

Give the advantages and disadvantages of each material. [9]

(c) Select **one** of the materials from (b) and sketch suitable tools for:

- (i) marking out the curves;
- (ii) removing the inner waste material. [6]

Section 2 – Processes

14 Fig. 6 shows an idea for a computer mouse holder.

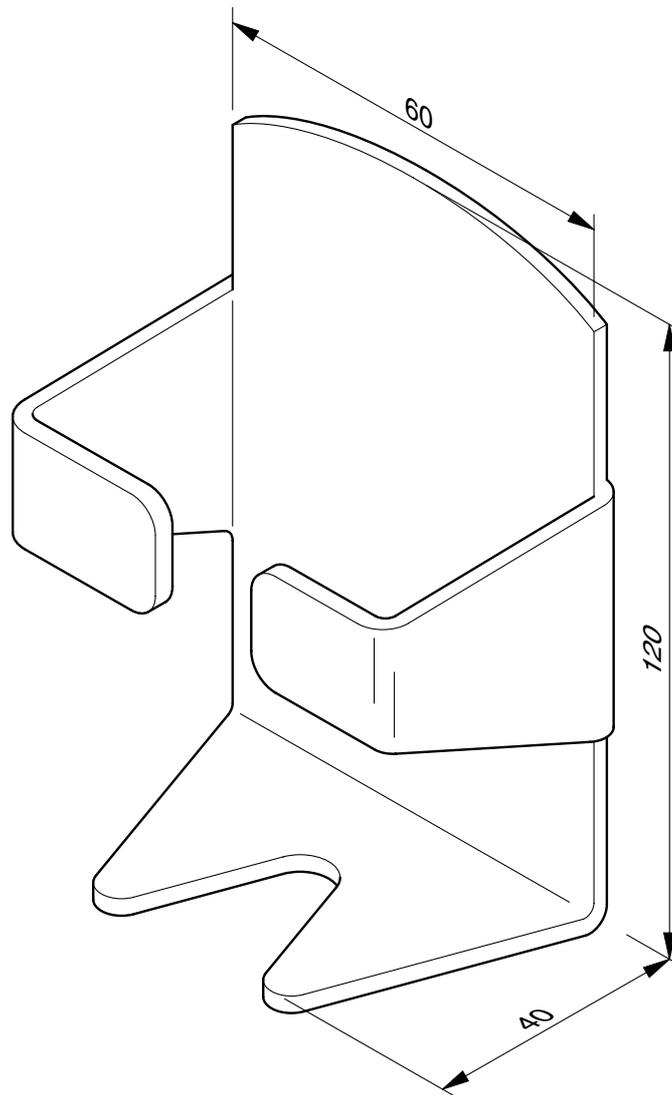


Fig. 6

- (a) State a suitable material for the holder and give **one** reason for your choice. [2]
- (b) Sketch the development [net] of the holder ready for cutting and bending. [3]
- (c) For the material you have stated in answer to (a), use notes and sketches to describe how:
- (i) the material would be held and cut to shape;
 - (ii) the edges would be finished;
 - (iii) the shape would be formed. [12]

15 Fig. 7 shows a spinning dice.

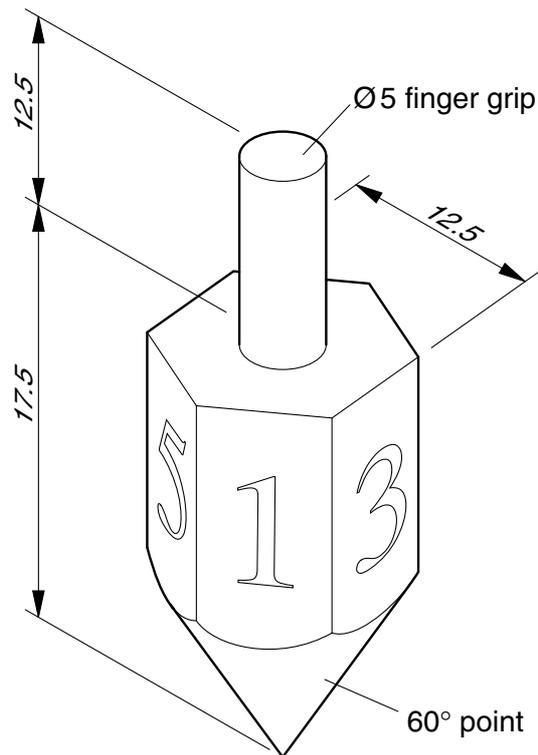


Fig. 7

(a) Suggest, with reasons:

(i) a suitable material for the dice.

(ii) a suitable method of producing a batch of 50.

[4]

(b) For the material and method of production you suggested in answer to (a), use notes and sketches to describe the **major** stages in making the dice. [10]

(c) Choose a suitable method for numbering the faces of the dice and explain how this would be done. [3]

16 The outline design for a Go-kart is given in Fig. 8.

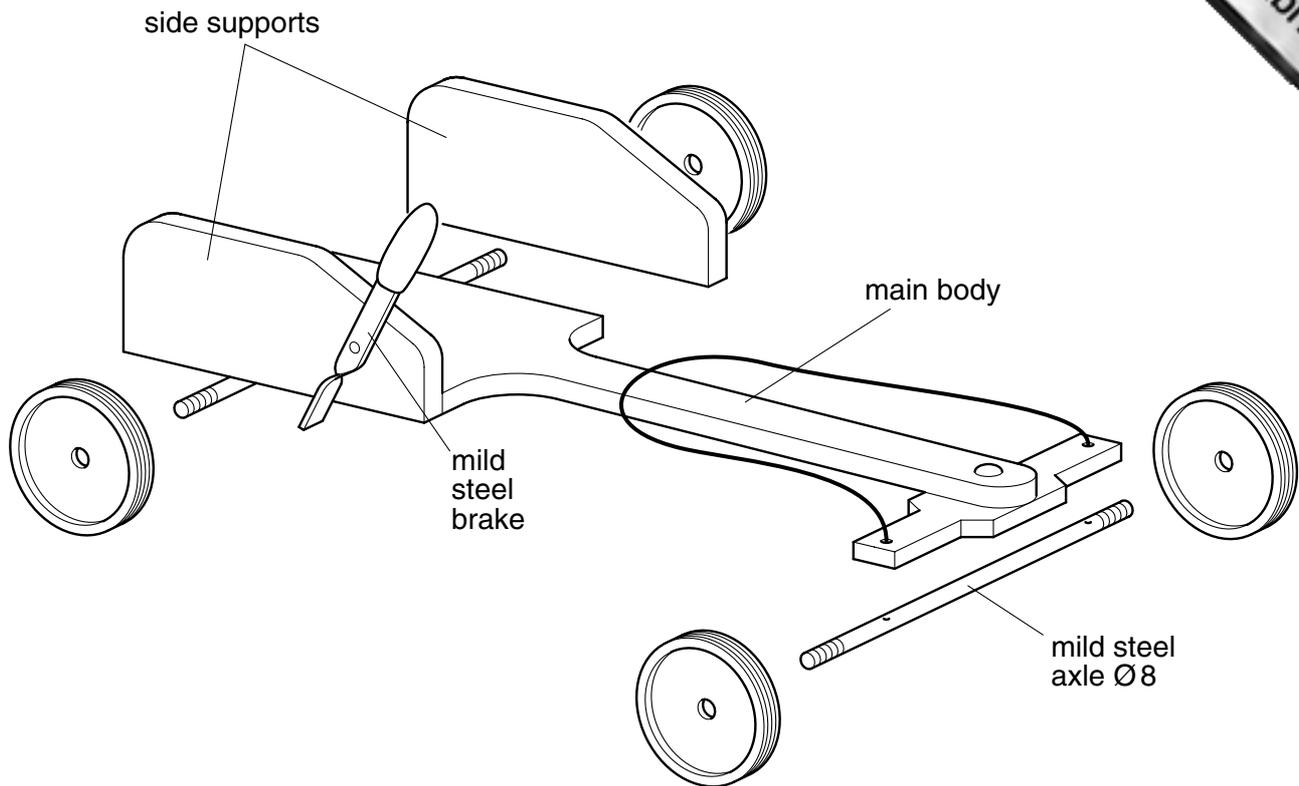


Fig. 8

Choose **two** of the following processes, **A**, **B**, **C**, and using notes and sketches describe how **each** would be carried out.

- A** Making 20 mm of screw thread on the ends of the Ø8 mild steel axle.
- B** Fixing the side supports to the main body with screws.
- C** Plastic coating the handle of the mild steel brake.

[17]

17 A number of small brackets as shown in Fig. 9 are to be made for a model construction.

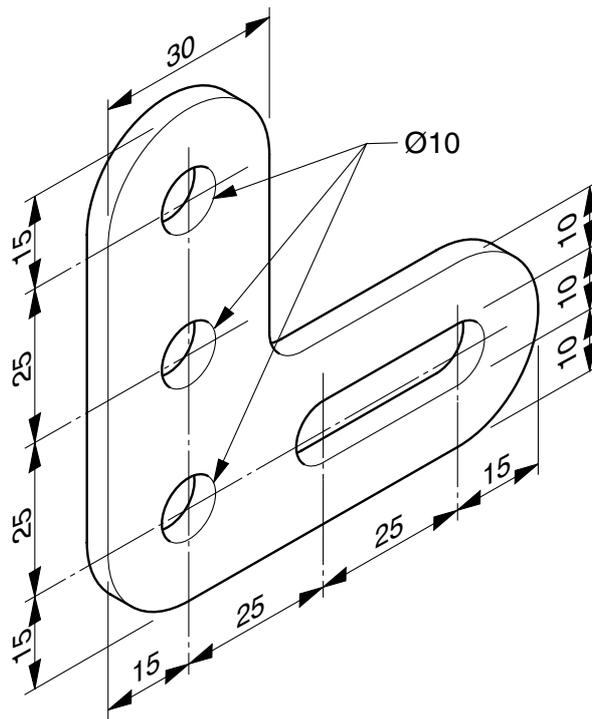


Fig. 9

- (a) Suggest a suitable material for the bracket and give **two** reasons for your choice. [3]
- (b) Using the material chosen in (a) describe, using notes and sketches, the following processes:
- (i) marking out the centres of the three $\text{Ø}10$ holes;
 - (ii) drilling the $\text{Ø}10$ holes;
 - (iii) making the slot. [12]
- (c) Explain why some materials need some form of surface preparation before marking out can take place. [2]

18 Fig. 10 shows the design for a domino to be used by partially sighted and blind people.

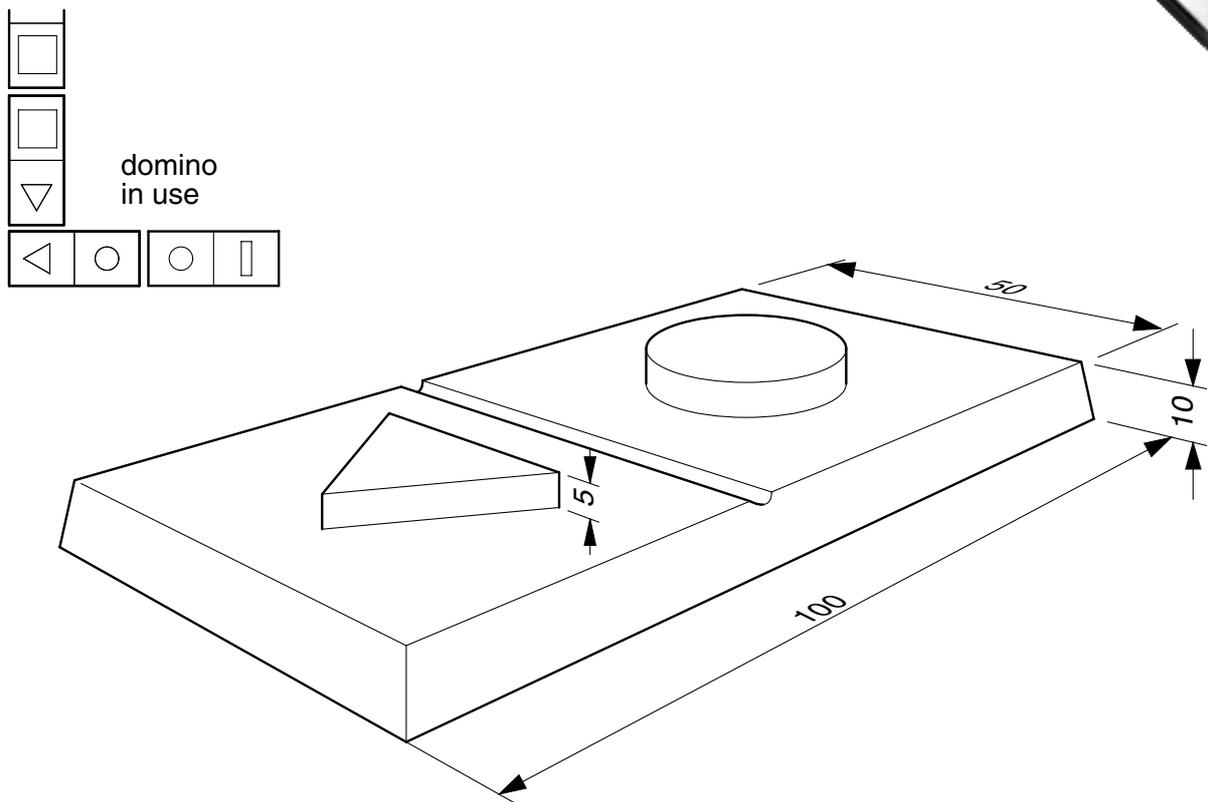


Fig. 10

- (a) State **two** important properties that the domino should have. [2]
- (b) Using materials of your own choice describe, using notes and sketches, how **one** domino could be made:
- (i) from a number of parts;
 - (ii) as a single piece of material. [12]
- (c) With the aid of sketches show how the domino could be further improved to aid people with poor sight. [3]

