



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
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DESIGN AND TECHNOLOGY

0445/33

Paper 3 Resistant Materials

May/June 2010

1 hour

Candidates answer on the Question Paper.

No Additional Materials are required.

To be taken together with Paper 1 in one session of 2 hours 15 minutes.

READ THESE INSTRUCTIONS FIRST

Write your Centre number, candidate number and name on all the work you hand in.

Write in blue or black pen.

You may use a soft pencil for any diagrams, graphs or rough working.

Do not use staples, paper clips, highlighters, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Section A

Answer **all** questions in this section.

Section B

Answer **one** question in this section.

You may use a calculator.

The total of the marks for this paper is 50.

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

For Examiner's Use	
Section A	
Section B	
Total	

This document consists of **13** printed pages and **3** blank pages.



Section A

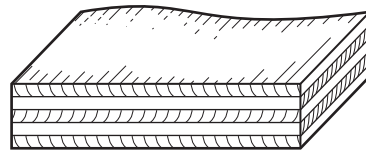
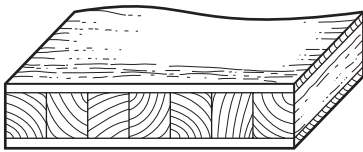
Answer **all** questions in this section.

- 1 Seasoning is the process by which solid wood is dried. There are two types of seasoning: air seasoning and kiln seasoning. Give **one** advantage of each type of seasoning.

Air seasoning advantage [1]

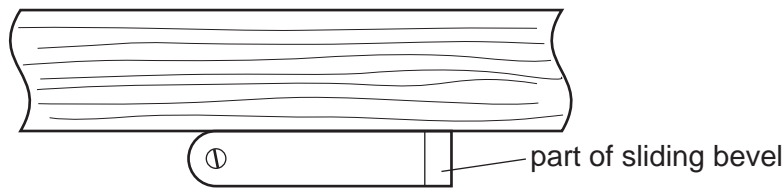
Kiln seasoning advantage [1]

- 2 Name each of the manufactured boards shown below.



..... [2]

- 3 Complete the drawing below of a sliding bevel being used to mark a line across the wood.



[2]

- 4 Fig. 1 shows a children's toy made from plastic.

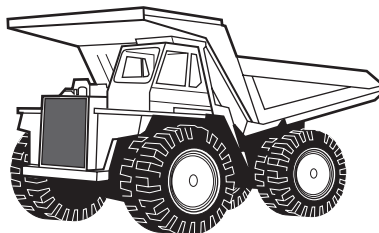


Fig. 1

- (a) Give **two** reasons why plastic is a suitable material for children's toys.

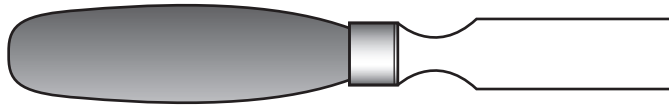
1 [1]

2 [1]

- (b) Name the process used to manufacture the parts of the children's toy shown in Fig. 1.

..... [1]

5 Complete the drawing below to show a bevel edge chisel.



[2]

6 Fig. 2 shows a piece of mild steel that has cracked on the bend.



Fig. 2

(a) State a possible cause of the cracks.

..... [1]

(b) Suggest what could have been done to the mild steel to prevent it from cracking.

..... [1]

7 Fig. 3 shows a face for a children's toy made from mild steel sheet. Name a suitable file that could be used to finish each of the shapes **A**, **B** and **C**.

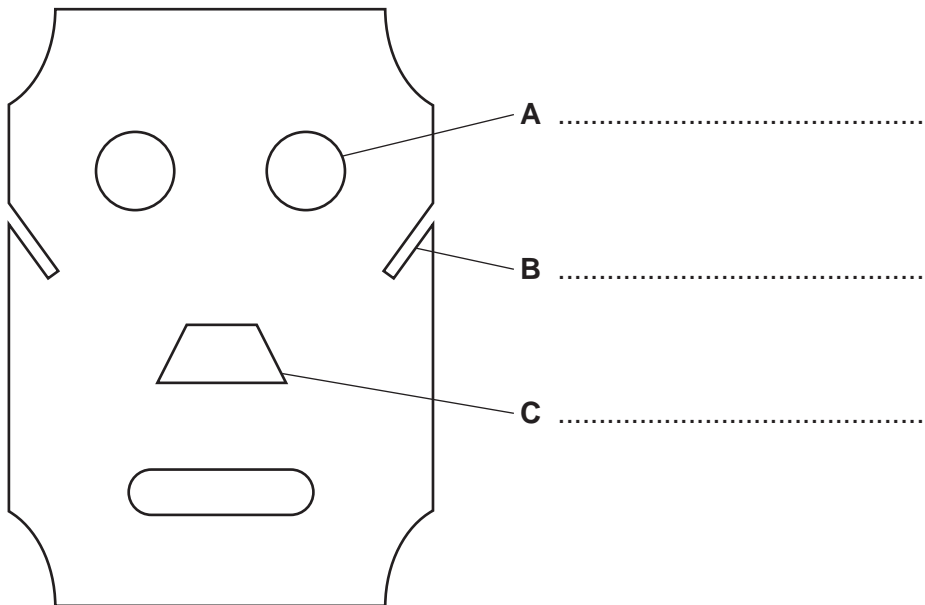
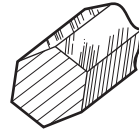
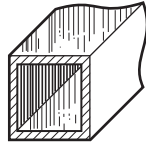


Fig. 3

[3]

8 Name the two standard metal sections shown below.



.....

[2]

9 Fig. 4a shows the parts used to construct the wheel assembly of a castor.

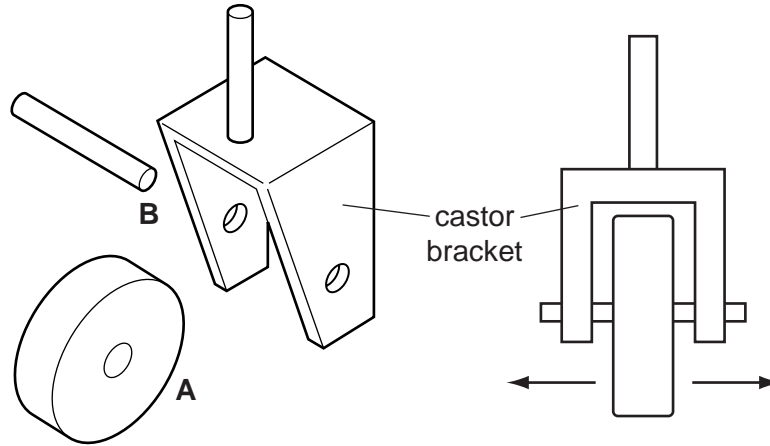


Fig. 4a

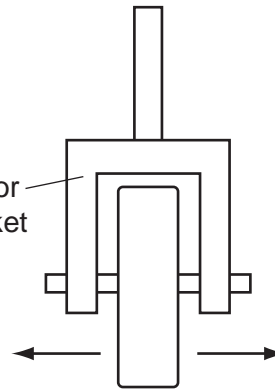


Fig. 4b

Complete Fig. 4b to show how:

- wheel **A** runs in the centre of the castor bracket and cannot move from side to side;
- axle **B** can be fixed in the castor bracket.

[4]

10 Fig. 5 shows a hook made from 3 mm diameter mild steel rod. The hook will be plastic coated.

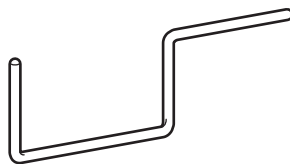


Fig. 5

Describe **three** important stages when plastic coating the mild steel rod.

1 [1]

2 [1]

3 [1]

Section B

Answer **one** question from this section.

- 11 Fig. 6a shows a coffee table made from softwood. Fig. 6b shows one leg of the coffee table marked out. The coffee table is to be self-assembled using only a screwdriver.

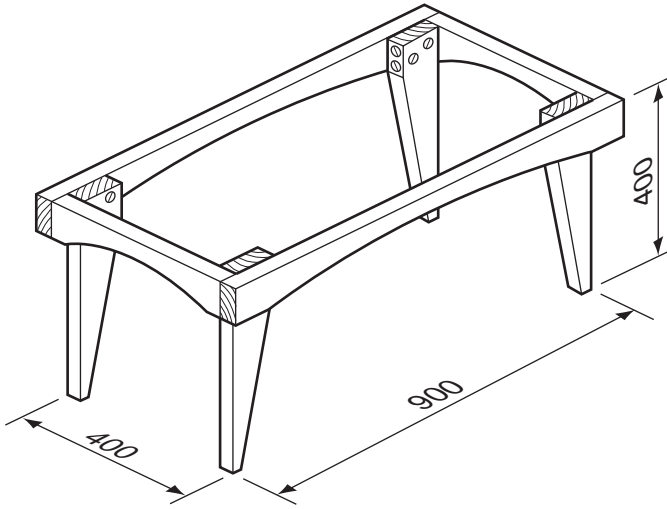


Fig. 6a

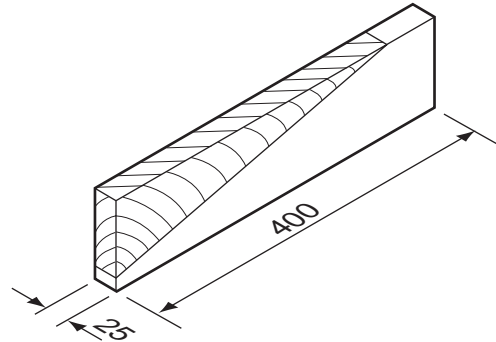


Fig. 6b

(a) Give **two** benefits to the manufacturer of producing furniture that is self-assembled.

1 [1]

2 [1]

(b) Give **one** benefit to the purchaser of buying self-assembly furniture.

..... [1]

(c) Use sketches and notes to show how **one** leg could be produced. Name the tools used.

[4]

(d) Fig. 7 shows one of the legs and the pre-drilled screw holes.

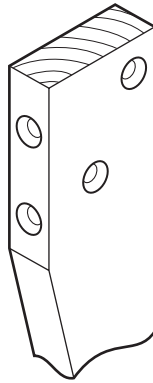


Fig. 7

Give **two** reasons why the screw holes are staggered.

1 [1]

2 [1]

(e) Fig. 8 shows a cross section of the side rail and the leg of the coffee table.

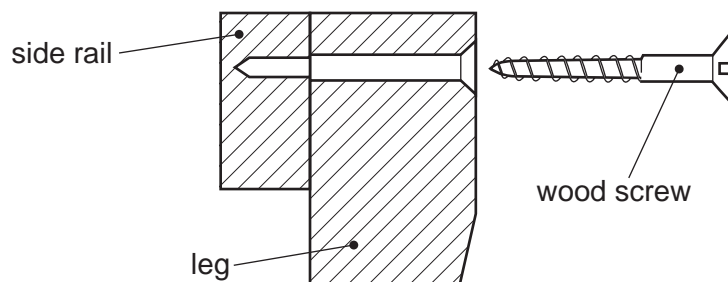
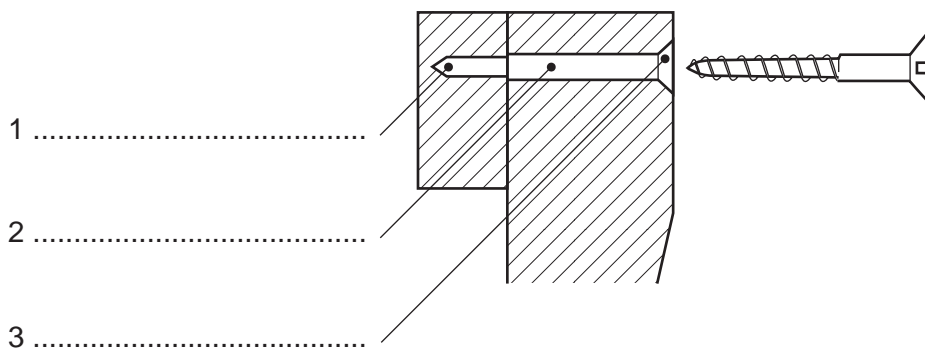


Fig. 8

Using the list below label, on the drawing, the three different pre-drilled holes required for the wood screw shown.

stopped hole clearance hole angled hole countersunk hole pilot hole



[3]

(f) Fig. 9 shows three softwood boards that will be glued together to make the table top.

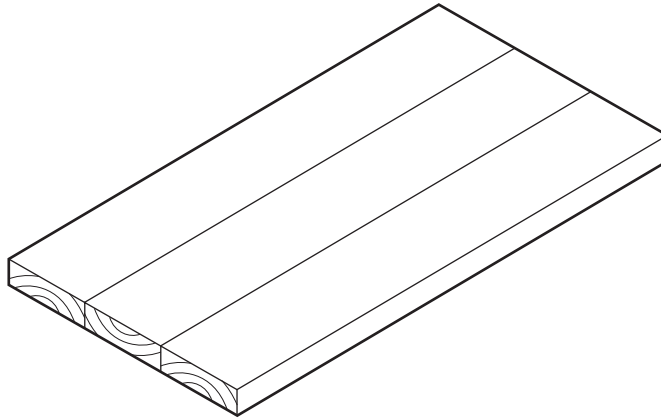


Fig. 9

(i) Give **one** reason why the table top is made from three separate boards.

..... [1]

(ii) Look carefully at the end grain on each board.
Explain why the boards have been arranged as shown.

.....
.....
..... [2]

(iii) Add to Fig. 9 to show how sash cramps would be used to clamp the boards when gluing them together. [3]

(iv) Give **two** reasons why lengths of scrap wood should be used when clamping the boards together.

1 [1]

2 [1]

(g) (i) Describe how the table top could be prepared before a finish is applied.

.....
.....
..... [3]

(ii) Name a suitable finish for the table top and give a reason for your choice.

Finish [1]

Reason [1]

12 Fig. 10 shows views of a photograph frame made from a single piece of 1 mm thick sheet metal.

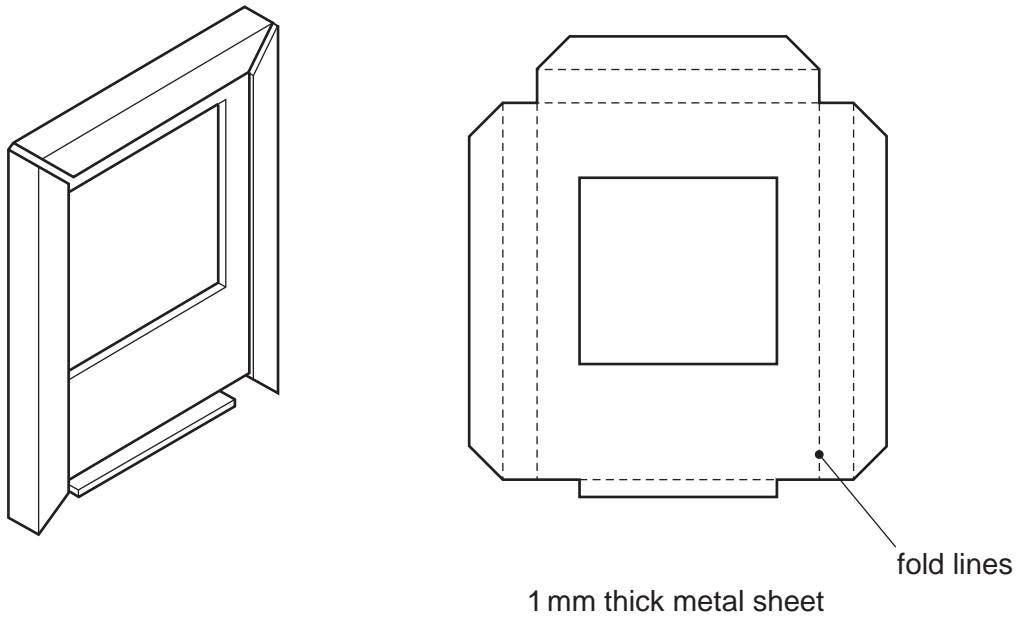


Fig. 10

(a) Name a suitable ferrous sheet metal for the photograph frame and give a reason for your choice.

Ferrous sheet metal [1]

Reason [1]

(b) Name **three** marking out tools used to mark out the shape of the photograph frame shown in Fig.10.

1 [1]

2 [1]

3 [1]

- (c)** Use sketches and notes to show how the outline shape of the photograph frame could be cut out of the sheet metal. Name the tools used.
Do not include details of the cut out space for the photograph.

[6]

- (d)** Use sketches and notes to show how the sides of the photograph frame could be folded accurately to the required shape. Name the tools and equipment used.

[5]

(e) (i) Name a suitable finish for the photograph frame.

..... [1]

(ii) Describe how the metal would be prepared to take the finish.

.....
..... [2]

(f) (i) Use sketches and notes to show a modification to the photograph frame so that it could be wall-mounted.

[3]

(ii) Use sketches and notes to show a modification to the photograph frame so that it could be freestanding.

[3]

13 Fig. 11 shows a desk tidy to be made in a school workshop.
The desk tidy is made from 3 mm thick acrylic.

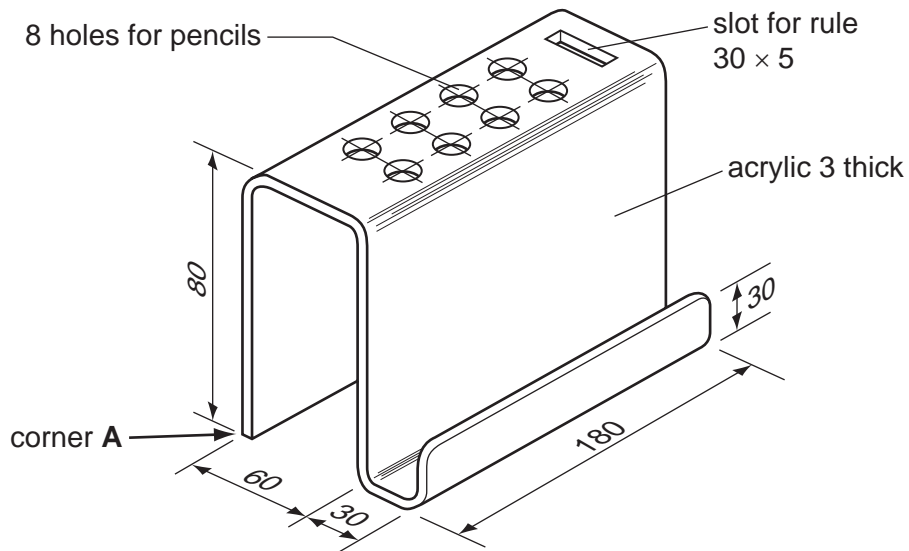
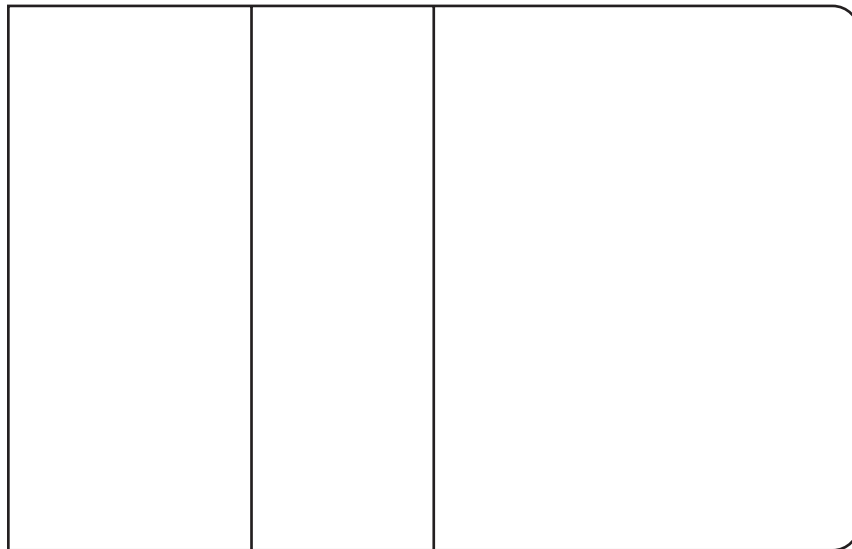


Fig. 11

(a) (i) Complete the development (net) below to show:

- all the bend lines;
- the slot for the rule.



corner A

[3]

(ii) Name **two** marking out tools used to draw the development (net) on a sheet of acrylic.

1 [1]

2 [1]

(iii) State the purpose of the backing paper often found on acrylic sheet.

..... [1]

(b) Give **two** properties of acrylic that makes it suitable for the desk tidy.

1 [1]

2 [1]

(c) Use sketches and notes to show how the slot for the rule could be produced.
Name the tools used.

[6]

(d) Describe how the edges of the acrylic could be finished to a high quality.

.....
.....
..... [3]

(e) Explain why it is important to clamp the acrylic sheet when drilling the holes.

.....
.....
..... [2]

(f) Use detailed sketches and notes to show how the acrylic sheet could be bent to the shape of the desk tidy.

[6]

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