



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

CANDIDATE  
NAME

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NUMBER

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**DESIGN AND TECHNOLOGY**

**0445/03**

Paper 3 Resistant Materials

**October/November 2007**

**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 dark 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.

**Section B**

Answer **one** question.

You may use a calculator.

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.

For Examiner's Use	
1	
2	
<b>Total</b>	

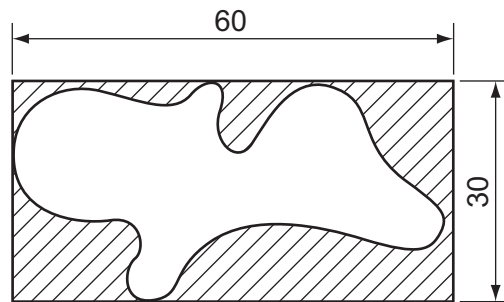
This document consists of **15** printed pages and **1** blank page.



**Section A**

Answer **all** questions in this section.

**1**



Name the type of saw used to cut the curved shape shown above when made from:

(a) 1 mm thick copper; ..... [1]

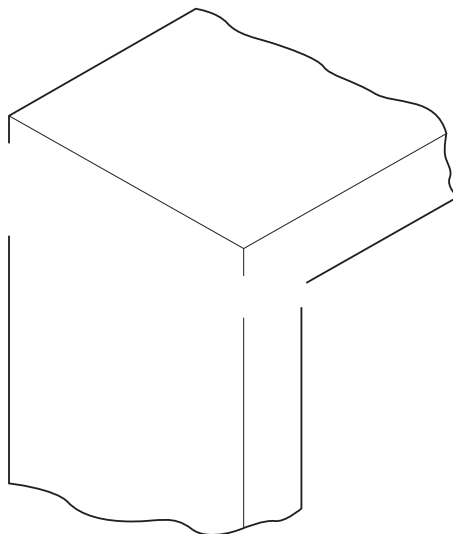
(b) 4 mm thick plywood. .... [1]

**2** Describe a specific use for the following adhesives:

(a) contact / impact; ..... [1]

(b) epoxy resin. .... [1]

**3** Complete the sketch below to show a lap joint.



[2]

4 Complete the table below by naming a suitable specific plastic for each product.

Product	Specific plastic
Packaging and insulation	
Electrical fittings	
Gear wheels	
Buckets and bowls	

[4]

5 Describe **two** methods of checking the squareness of the frame shown in Fig.1.

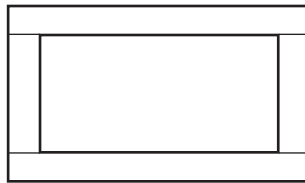
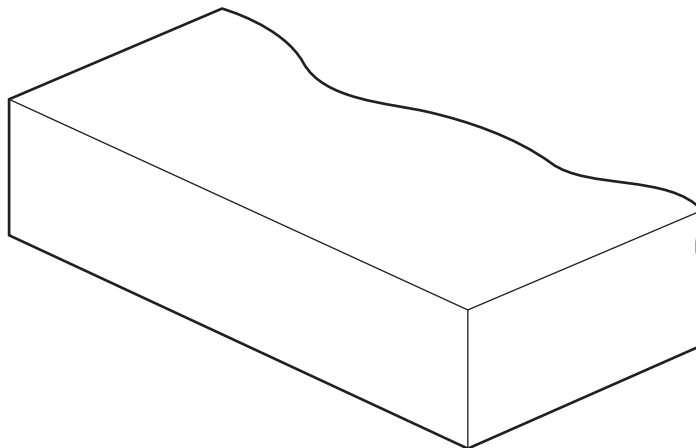


Fig. 1

1 ..... [1]

2 ..... [1]

6 Complete the sketch below to show the construction of plywood.



[2]

7 Fig.2 shows a round bar of metal.

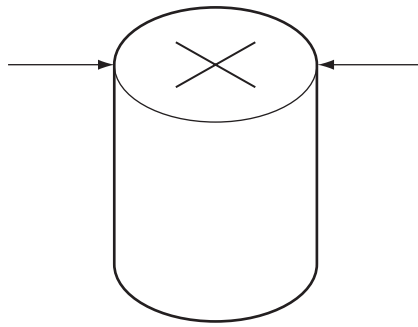


Fig. 2

Name the tool used to:

(a) measure the outside diameter of the round bar;

..... [1]

(b) find the centre of the round bar.

..... [1]

8 Knurled surfaces are produced on tools such as scribers and centre punches.

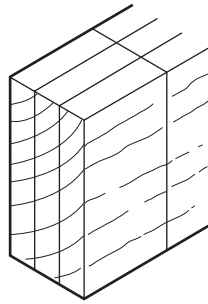
(a) Explain the purpose of a knurled surface.

..... [1]

(b) Describe how the knurled surface could be produced.

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

9 Name **two** marking out tools used to mark out the joint shown below.



solid wood

1 ..... [1]

2 ..... [1]

10 Fig. 3 shows three boards that have been glued together.

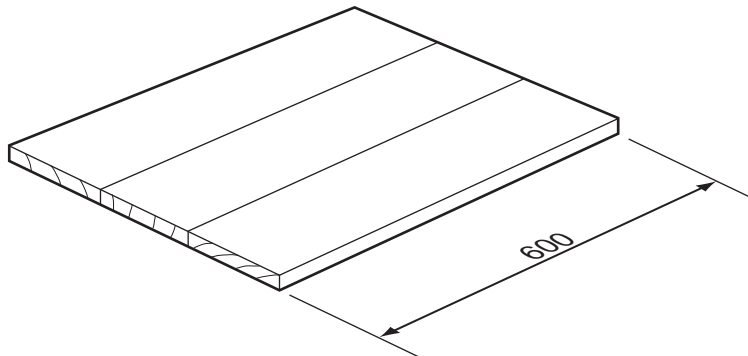


Fig. 3

(a) Name the cramps used to hold the boards together when glued.

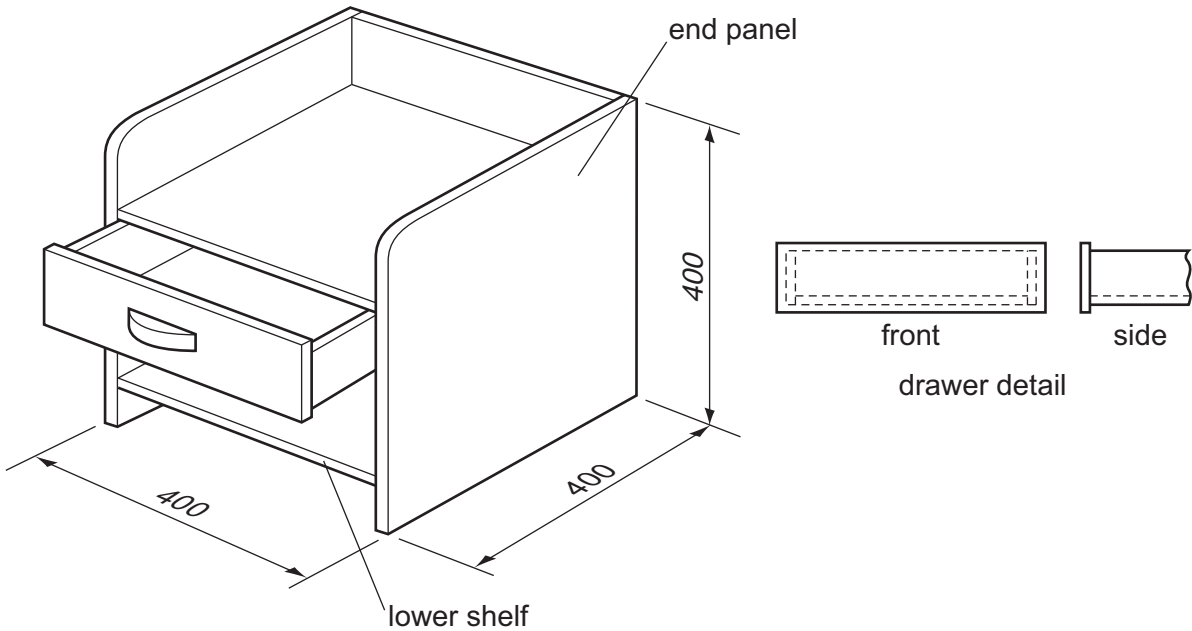
.....cramps [1]

(b) Add to Fig. 3 to show how **three** cramps would be used to hold the boards together. [3]

**Section B**

Answer **one** question in this section.

11 Fig. 4 shows views of a bedside cabinet made from manufactured board.



**Fig. 4**

**(a) (i)** Name a suitable manufactured board for the bedside cabinet.

..... [1]

**(ii)** Give **two** reasons why a manufactured board would be more suitable than solid wood for the bedside cabinet.

1 ..... [1]

2 ..... [1]

**(iii)** Suggest a suitable thickness for the end panel.

..... [1]

(b) Fig. 5 shows the two end panels and the two shelves marked out on a length of manufactured board.

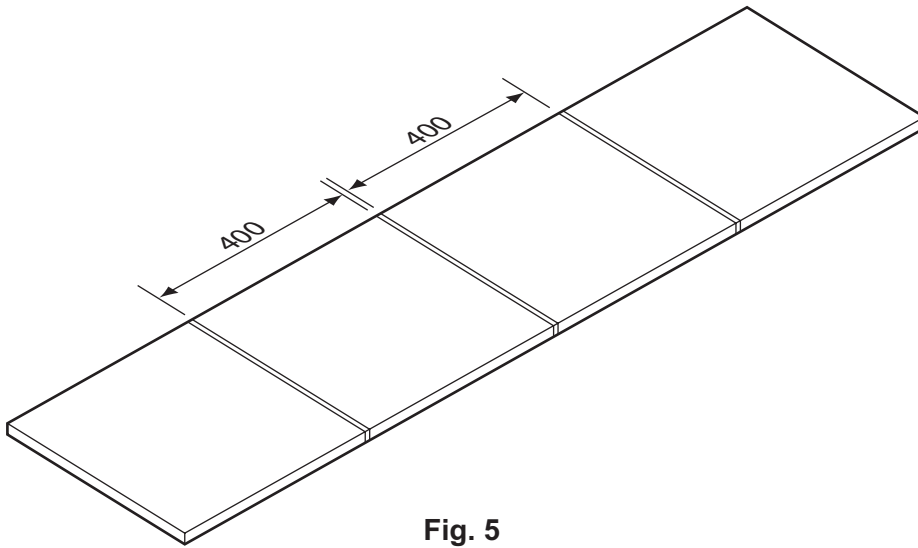


Fig. 5

(i) Name **two** marking out tools used to mark out the end panels and shelves.

1 ..... [1]

2 ..... [1]

(ii) Explain why there is a space between each of the 400 mm lengths.

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

(iii) Name a saw that could be used to saw the end panels and shelves from the length of manufactured board.

..... [1]

(iv) Some manufactured boards splinter when they are sawn.

Describe how this problem may be overcome.

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

**(c)** Use notes and sketches to show how the lower shelf and end panel:

**(i)** could be joined together temporarily, using knock-down [K-D] fittings;

[4]

**(ii)** could be joined together permanently.

[4]

**(d)** Use notes and sketches to show how the drawer could be located inside the cabinet without adding another shelf.

Include details of all materials, fittings and fixings you would use.

[6]



12 Fig. 6 shows a moneybox made from plastic.

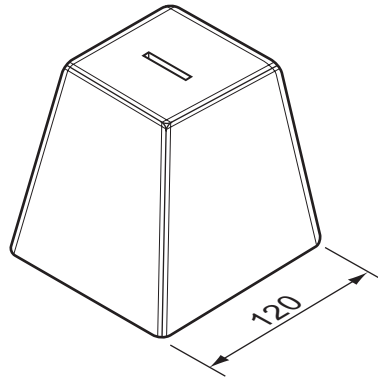


Fig. 6

(a) (i) The moneybox will be produced by vacuum forming.

Name a suitable plastic for the moneybox.

..... [1]

(ii) Name **two** other household products that are produced by vacuum forming.

1 ..... [1]

2 ..... [1]

(b) Fig. 7 shows the former used to make the moneybox attached to a board ready to vacuum form.

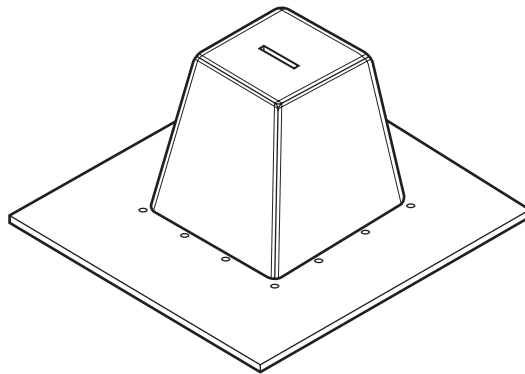


Fig. 7

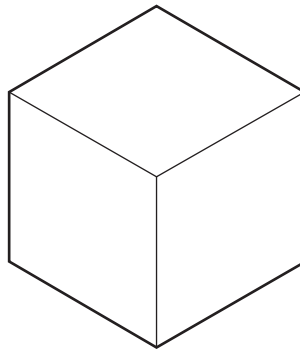
State **three** features of the former that will ensure that the moneybox can be vacuum formed successfully.

1 ..... [1]

2 ..... [1]

3 ..... [1]

(c) Fig. 8 shows a wooden block from which the former of the moneybox will be made.



**Fig. 8**

Use notes and sketches to show how the former could be made from the wooden block. Include details of the following stages:

- marking out;
- holding the block and sawing it to shape;
- smoothing the sides and rounding the corners.

[6]

- (d) Complete the table below by giving details of the stages in vacuum forming the moneybox.

Vacuum forming stages
Position former on platen of vacuum forming machine
Remove plastic from machine

[5]

- (e) Use notes and sketches to show how a base could be fitted to the moneybox. The base must be capable of removal. The design of the moneybox may be modified to take the base.

[6]

- (f) The moneybox in Fig. 6 could be made from wood.

Give **one** advantage and **one** disadvantage of using vacuum formed plastic for the moneybox rather than wood.

Advantage .....

..... [1]

Disadvantage .....

..... [1]

13 Fig. 9 shows a garden lantern.

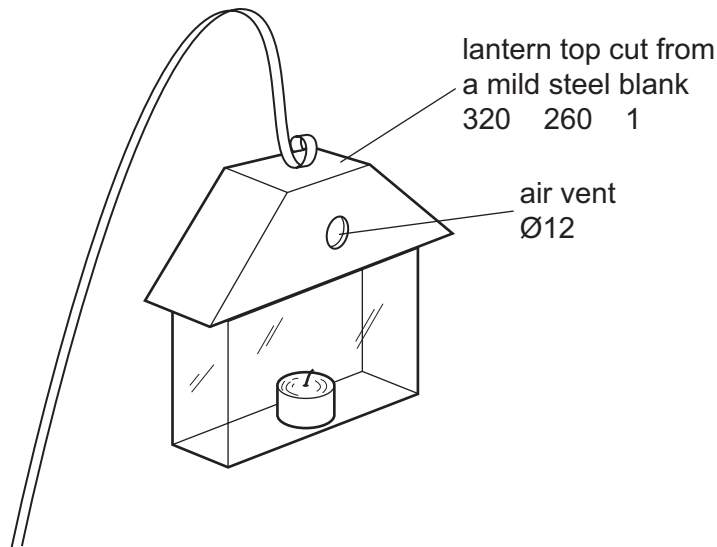


Fig. 9

(a) Fig. 10 shows the incomplete development [net] of the top of the lantern.

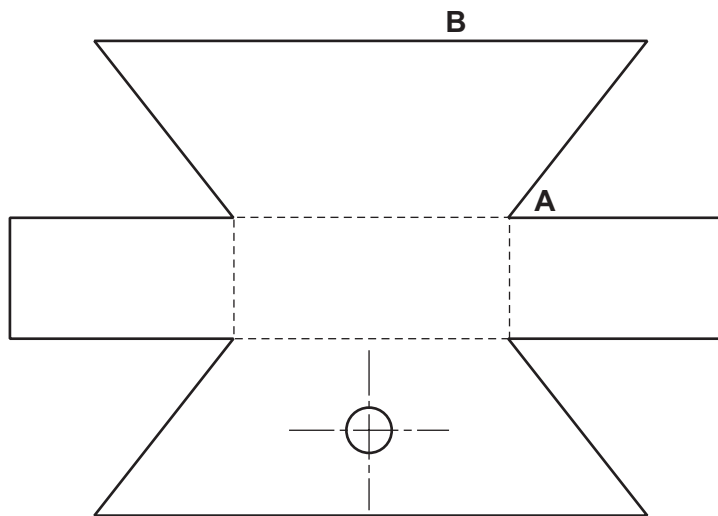


Fig. 10

(i) Name **three** marking out tools used to mark out the development [net] on mild steel sheet.

- 1 ..... [1]
- 2 ..... [1]
- 3 ..... [1]

(ii) Describe how a template could be used to assist manufacture of twenty lanterns.

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

(iii) Tabs are to be added to the development [net] to allow the top to be joined together.

Complete the development [net] in Fig. 10 by adding the tabs. [4]

(b) Name **two** tools used to cut out the 1 mm thick mild steel shape.

1 ..... [1]

2 ..... [1]

(c) (i) Name the type of file that would be used to file inside corner **A** in Fig. 10.

..... [1]

(ii) Use notes and sketches to show how the mild steel sheet could be held so that edge **B** in Fig. 10 could be filed flat.

[4]

(d) The hole for the air vent in Fig. 9 will be drilled using a drilling machine.

Describe **one** possible danger when drilling thin sheet material.

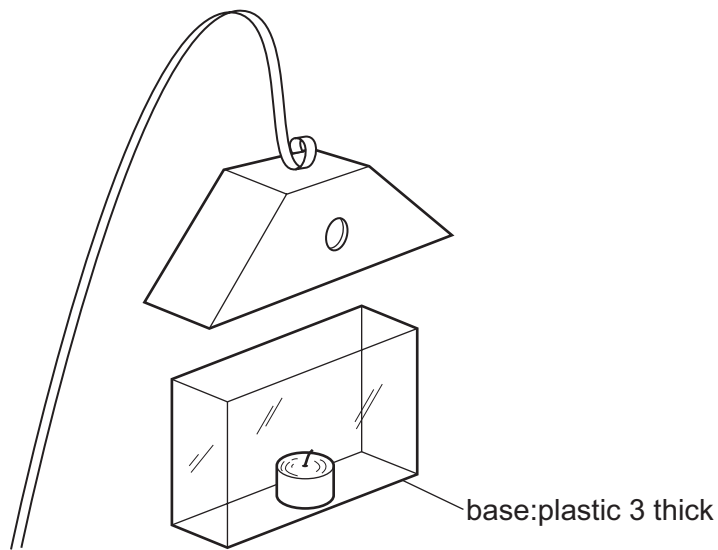
.....  
..... [2]

(e) The mild steel top of the lantern will be painted.

Give **two** reasons why the top will need to be painted.

1 ..... [1]  
2 ..... [1]

(f) Fig. 11 shows the lantern top separated from its base.



**Fig. 11**

Use notes and sketches to show how the top and the base could be fixed together. Modifications to the top and/or the base may be carried out to enable the parts to be fixed together.

[5]

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