



UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE
NAME

CENTRE
NUMBER

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CANDIDATE
NUMBER

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DESIGN AND TECHNOLOGY

0445/33

Paper 3 Resistant Materials

May/June 2012

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 **16** printed pages.



Section A

Answer **all** questions in this section.

1 Fig. 1 shows a bradawl.

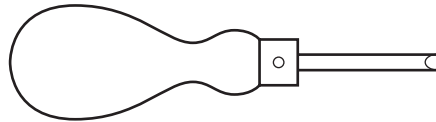


Fig. 1

State the purpose of a bradawl.

..... [1]

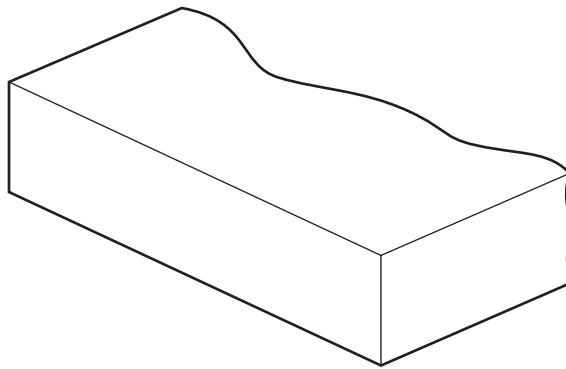
2 Give a specific use for each of the following adhesives:

(a) PVA [1]

(b) Epoxy resin [1]

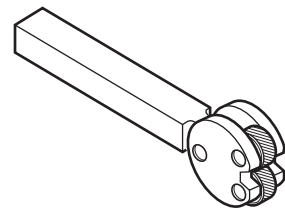
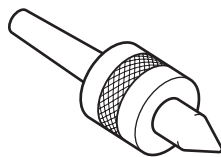
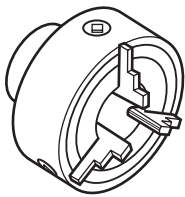
(c) Contact (impact) [1]

3 Complete the drawing below to show the construction of plywood.



[2]

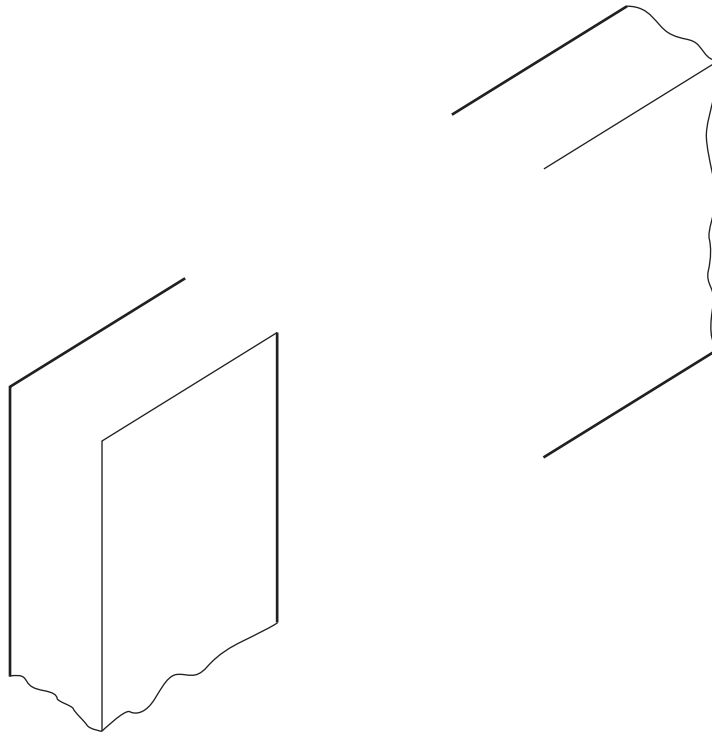
4 Name the three items of equipment shown below that are used with a centre lathe.



.....

[3]

5 Complete the drawing below to show a corner bridle joint.



[3]

6 Fig. 2 shows a hot melt glue gun.

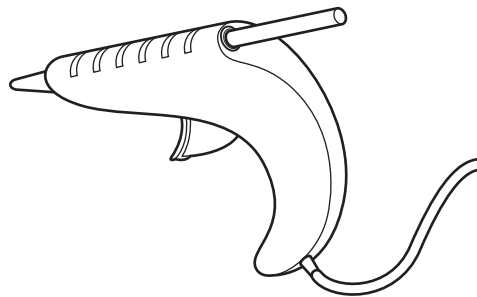


Fig. 2

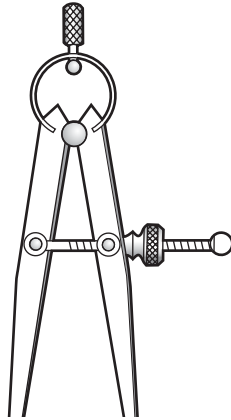
(a) State **one** benefit of using a hot melt glue gun.

..... [1]

(b) State **one** safety precaution you would take when using a hot melt glue gun.

..... [1]

- 7 Complete the drawing below to show how the inside calipers would be used to measure the inside of a tube.



[2]

- 8 Fig. 3 shows a fault that can occur when vacuum forming sheet plastic over a mould. The fault is called 'webbing'.

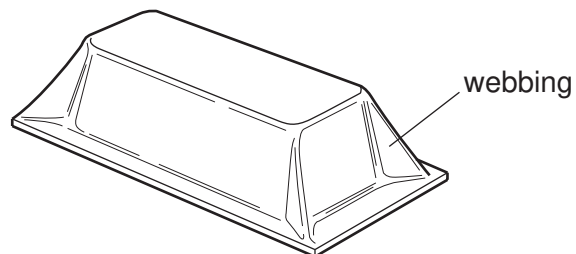


Fig. 3

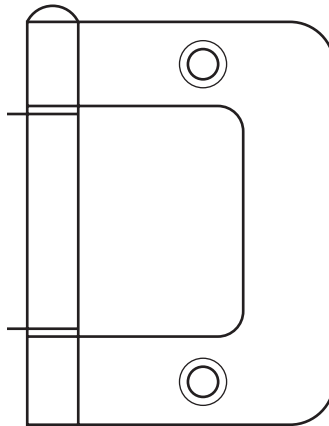
- (a) Give **one** possible cause of webbing.

..... [1]

- (b) Give **one** other fault that can occur when vacuum forming.

..... [1]

9 (a) Complete the drawing below to show a flush hinge.





[2]

(b) State **one** advantage of using a flush hinge rather than a butt hinge.

..... [1]

10 The table below shows two types of plane used to plane wood. Complete the table by naming each plane and stating a specific use.

Plane	Name	Specific use
		
		

[4]

Section B

Answer **one** question from this section.

- 11 Fig. 4 shows views of a table for a computer monitor. The table is made from 18 mm thick veneered manufactured board. It is designed as flat-pack for self-assembly.

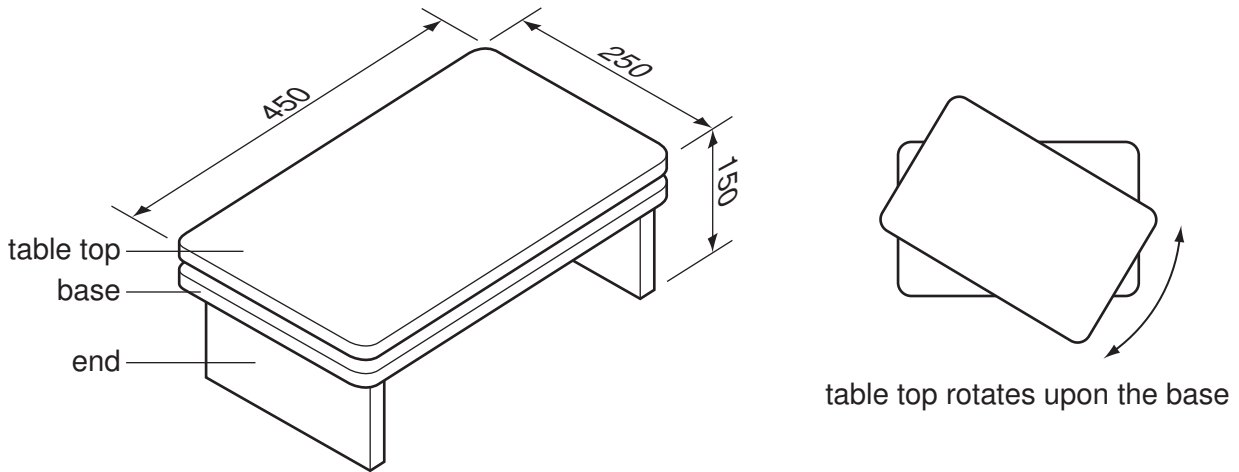


Fig. 4

- (a) (i) Give **two** advantages, other than cost, of using manufactured board rather than solid wood for the table.

1 [1]

2 [1]

- (ii) The manufactured board is veneered. Explain what is meant by the term *veneered*.

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

- (iii) The edges of the manufactured board are unattractive. Use sketches and notes to describe how the appearance of the edges could be improved.

[3]

- (b) Fig. 5 shows the table top, base and ends of the table marked out on a length of veneered manufactured board.

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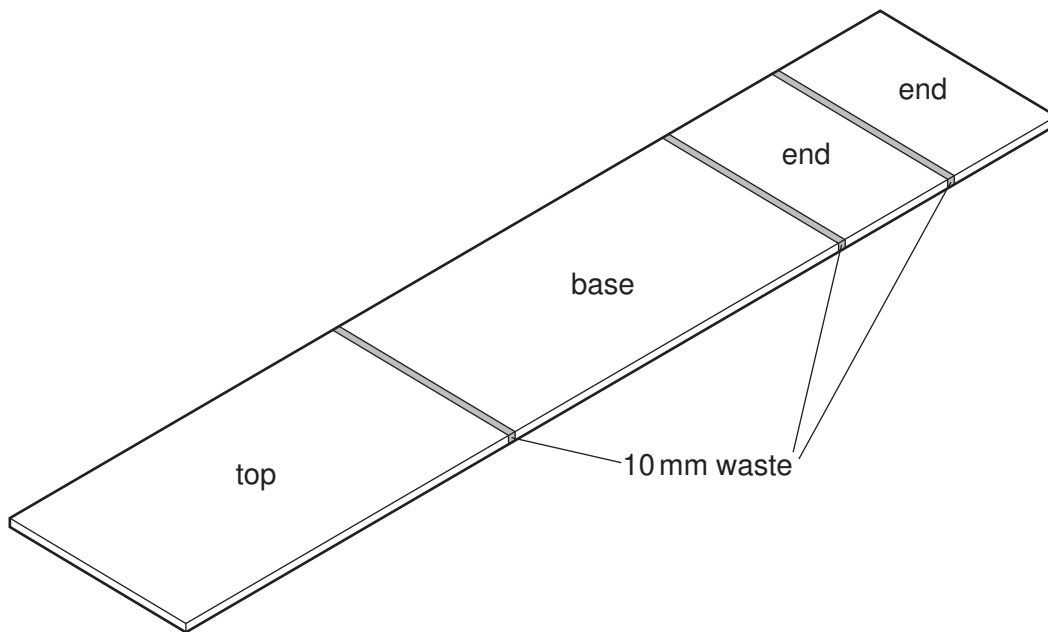


Fig. 5

- (i) Give **one** reason why 10 mm waste has been allowed between each piece marked to length.
 [1]
- (ii) Give **one** reason why the lines are marked out using a marking knife rather than a pencil.
 [1]
- (iii) Name a machine saw that could be used to cut the parts of the table to length.
 [1]
- (iv) State **one** safety precaution you would take when using the saw named in (iii).
 [1]

- (c) Fig. 6 shows an exploded view of parts of the table, including the dowel pegs and glue used to join the ends to the base.

Provide a set of written instructions that could be used by consumers to assemble the parts shown.

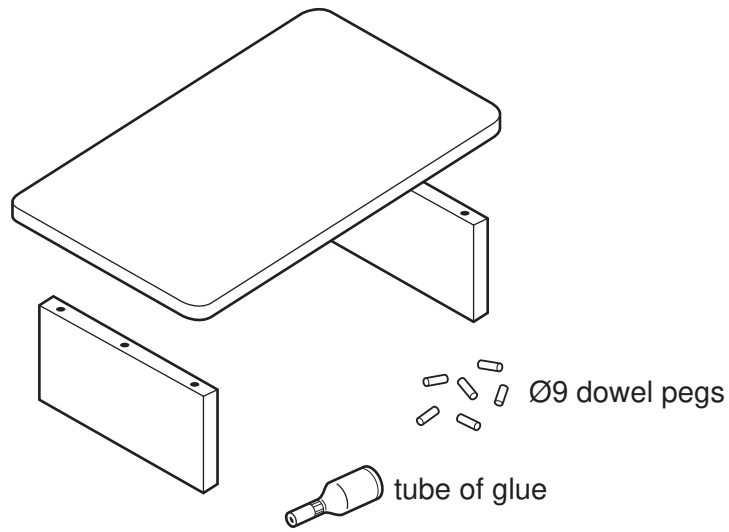


Fig. 6

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

- (d) Use sketches and notes to show how you would ensure that the holes for the dowel pegs in the ends and base line up accurately.

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[4]

- (e) Use sketches and notes to show how the table top could be made to rotate upon its base. Your method must:
- enable the table top to remain level at all times;
 - include details of materials, sizes and fittings used.

[4]

12 Fig. 7 shows a rack for holding files. The rack is made from 1.6 mm thick mild steel sheet.

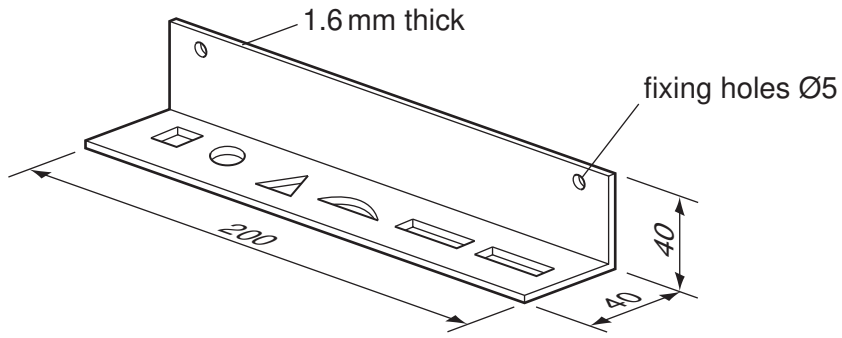


Fig. 7

(a) Fig. 8 shows the rack marked out on mild steel sheet.

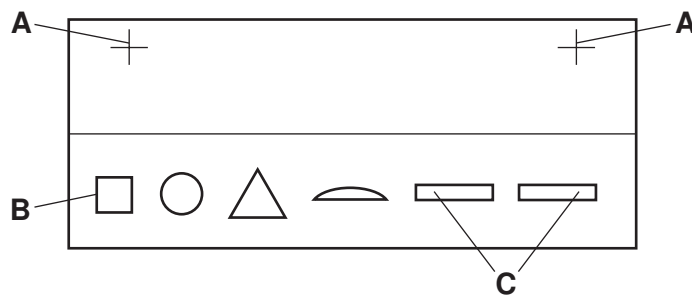


Fig. 8

(i) Name **two** tools you would use to mark the centres **A** where the holes will be drilled.

1 [1]

2 [1]

(ii) Use sketches and notes to show how you would cut out the square shape **B**. Include details showing how the sheet steel would be held during the process.

[4]

(iii) Name **two** different files that could be stored in the spaces labelled **C**.

1 [1]

2 [1]

(b) Use sketches and notes to show how the mild steel sheet could be bent to form the rack.
Name all the tools and equipment used.

[3]

(c) In use, two problems were found with the design of the rack.

- the rack bends when all the files are in place;
- the files are difficult to remove.

Use sketches and notes to show how these two problems could be overcome.
You must **not** change the thickness of the steel sheet used for the file rack.

[4]

(d) (i) The rack could be made from the single piece of steel section shown in Fig. 9.

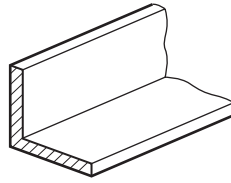


Fig. 9

Name the standard metal section shown in Fig. 9.

..... [1]

(ii) State **one** advantage and **one** disadvantage of using this standard metal section rather than mild steel sheet for the rack.

Advantage [1]

Disadvantage [1]

(e) Sketch a nut and bolt that could be used to fix the rack to a cupboard door.

[2]

(f) Use sketches and notes to show how the design of the file rack shown in Fig. 7 could be modified so that it is freestanding rather than wall-mounted. Include details of materials, sizes and fittings used.

[5]

13 Fig. 10 shows a notelet holder made from hardwood.

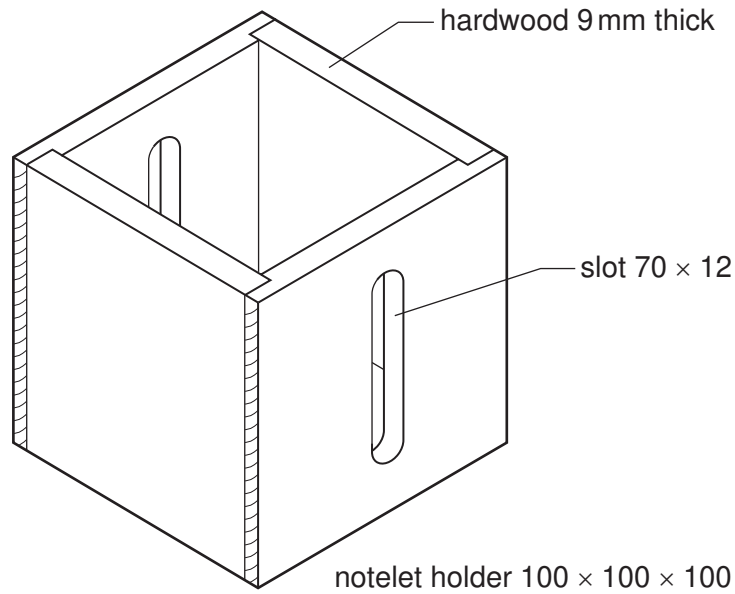


Fig. 10

(a) (i) Name a suitable hardwood for the notelet holder.

..... [1]

(ii) Describe **two** features of hardwoods that can make them attractive.

1 [1]

2 [1]

(b) Use sketches and notes to show how **one** of the slots could be cut out.

[4]

- (c) A lapped joint is used to join the sides together at each corner. Fig. 11 shows part of the lapped joint marked out.

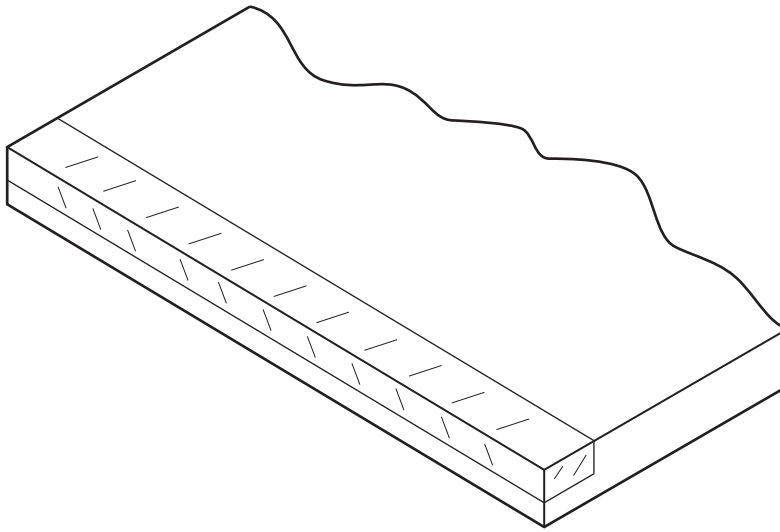


Fig. 11

- (i) Indicate clearly, on Fig. 11, **one** line that would be marked out using a marking gauge and **one** line that would be marked out using a cutting gauge. [2]
- (ii) Use sketches and notes to show how you would cut out the lapped joint. Name all the tools and equipment used.

[4]

(d) Fig. 12 shows the four sides of the notelet holder ready to be glued.

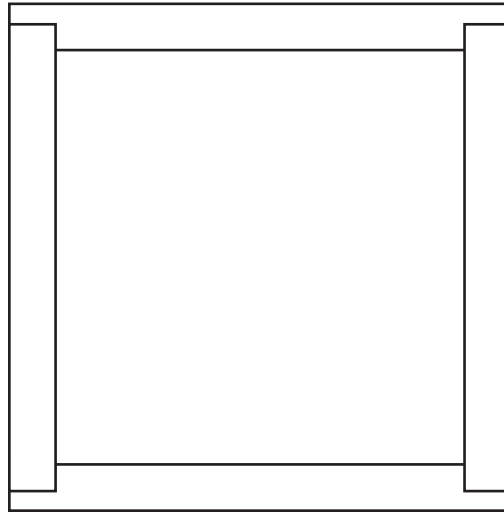


Fig. 12

(i) Add sketches and notes to Fig. 12 to show how the sides could be held together while the glue sets, without the use of sash cramps or G cramps. [2]

(ii) Describe **two** ways of checking the construction for squareness.

1 [1]

2 [1]

(e) Use sketches and notes to show how a base could be fitted to the inside of the notelet holder.

[3]

- (f) The notelet holder could be made from a single piece of acrylic sheet. Use sketches and notes to show a design for a similar notelet holder made from a single piece of acrylic sheet.

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[5]

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