UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME	
CENTRE NUMBER	CANDIDATE NUMBER

* 1 8 1 3 3 0 8 8 1 5 *

DESIGN AND TECHNOLOGY **0445/32**

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.

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Section A	
Section B	
Total	

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

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Section A

Answer **all** questions in this section.

1 **(a)** Complete the drawings below to show a slot head screw and a Phillips head screw.



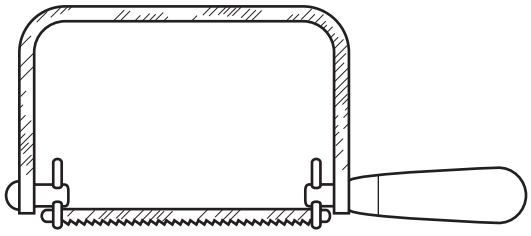
slot head screw Phillips head screw

[2]

(b) Give **one** advantage of using a Phillips head screw rather than a slot head screw.

..... [1]

2 Describe **two** checks you would carry out to the coping saw shown below before using it.



1 ..... [1]

2 ..... [1]

3 **(a)** Complete the sketch below to show a tongue and groove joint.



[2]

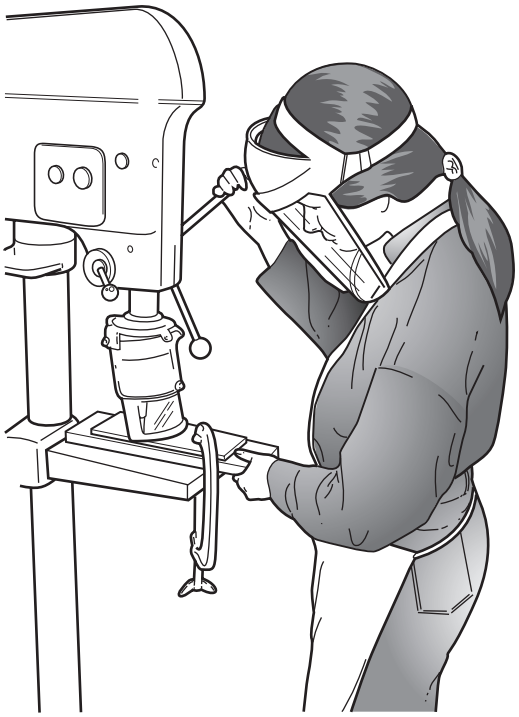
(b) Give **one** example where a tongue and groove joint could be used.

..... [1]

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4 The student shown below is using the drilling machine safely.



Identify **three** safe working practices.

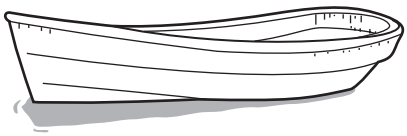
1 ..... [1]

2 ..... [1]

3 ..... [1]

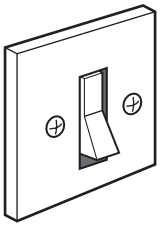
5 Name a thermosetting plastic to make each of the products shown below.

(a)



..... [1]

(b)



..... [1]

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6 **(a)** Complete the sketch below to show a Tee hinge.

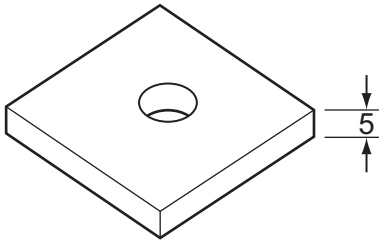


[2]

(b) State **one** use for a Tee hinge.

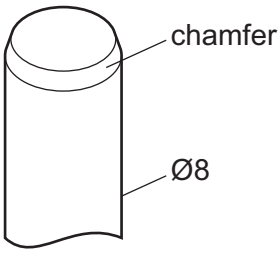
..... [1]

7 **(a)** Name the tool used to cut a screw thread in the steel plate shown below.



..... [1]

(b) Name the tool used to cut a screw thread on the steel rod shown below.



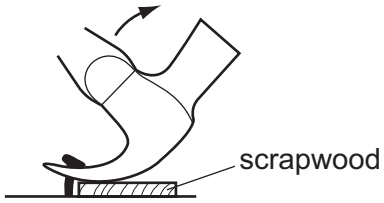
..... [1]

(c) State the purpose of the chamfer on the end of the steel rod shown in **(b)**.

..... [1]

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8 **(a)** Name the type of hammer shown below being used to pull out a nail.



..... [1]

(b) Give **one** reason why scrapwood is used when pulling out the nail.

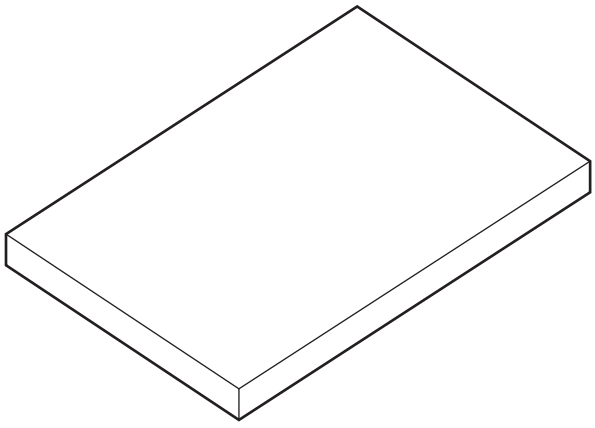
..... [1]

9 Two pieces of 6 mm thick mild steel are shown below.
Complete the sectional view below to show a countersunk head rivet joining the two pieces of steel.



[2]

10 Complete the sketch below to show a bench hook.



[2]

Section B

Answer **one** question in this section.

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11 Fig. 1 shows an incomplete design for a cabinet made as flat pack for self-assembly.

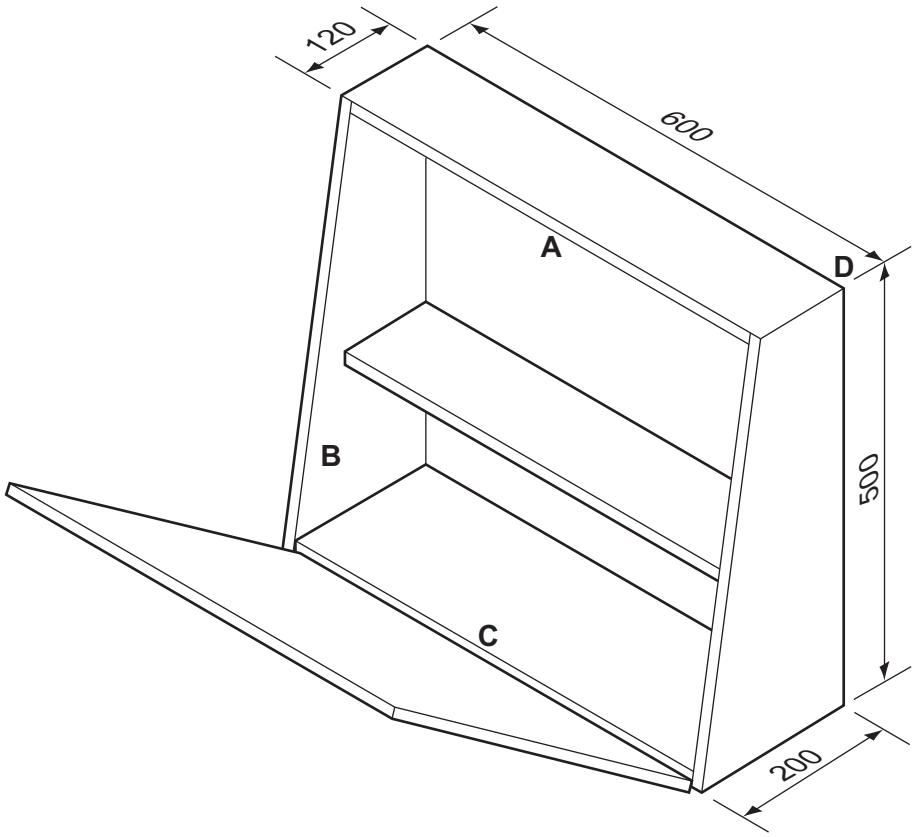


Fig. 1

(a) A cutting list of materials for the cabinet is shown below.
Complete the cutting list.

Part	Number required	Length	×	Width	×	Thickness	Material
Top	1	600	×	120	×	15	Veneered MDF
Base	1	600	×		×	15	Veneered MDF
Sides	2	500	×		×	15	Veneered MDF
Door	1		×	510	×	15	Veneered MDF
Shelf	1	600	×		×	15	Veneered MDF
Back	1		×		×	4	Plywood

[6]

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(b) (i) Name **three** pre-manufactured components that could be used at :

A, to keep the door closed ..... [1]

B, to hold the door in a horizontal position when open..... [1]

C, to allow the door to pivot from the base ..... [1]

(ii) Use sketches and notes to show how **one** of the pre-manufactured components named in **(b)(i)** would be fitted to the cabinet. Name the tools and equipment used.

[6]

(c) Use sketches and notes to show how the edges of the veneered MDF could be lipped to improve their appearance.

[3]

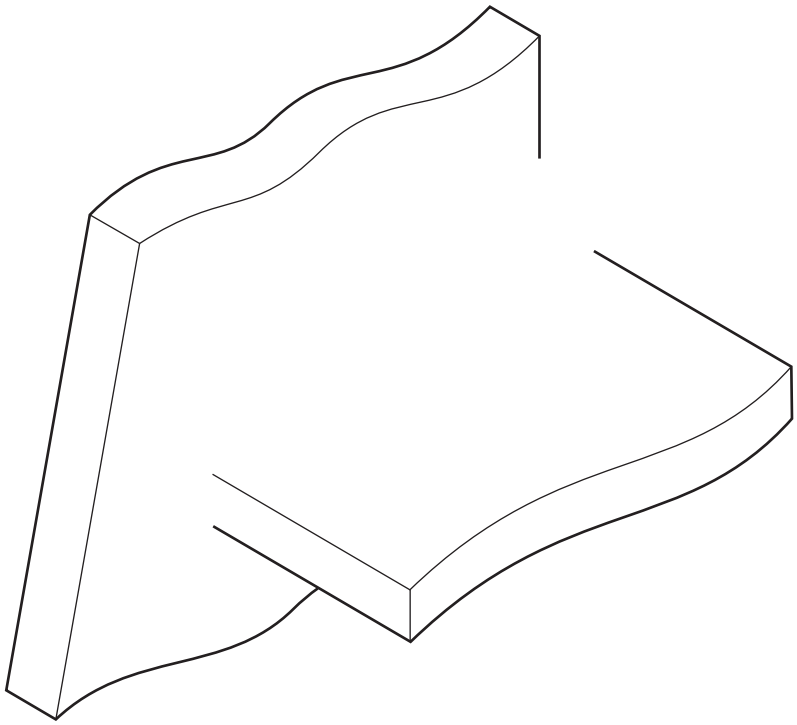
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[Turn over

(d) Use sketches and notes to show how a suitable KD (knock-down) fitting could be used to join the top to the side at corner **D**.

[3]

(e) (i) Complete the drawing below to show a suitable construction used to join the shelf to the sides of the cabinet permanently.



[3]

(ii) Name of joint shown in **part (i)** ..... [1]

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Question 12 starts on the next page

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12 Fig. 2 shows an A3 drawing board and adjustable stand.

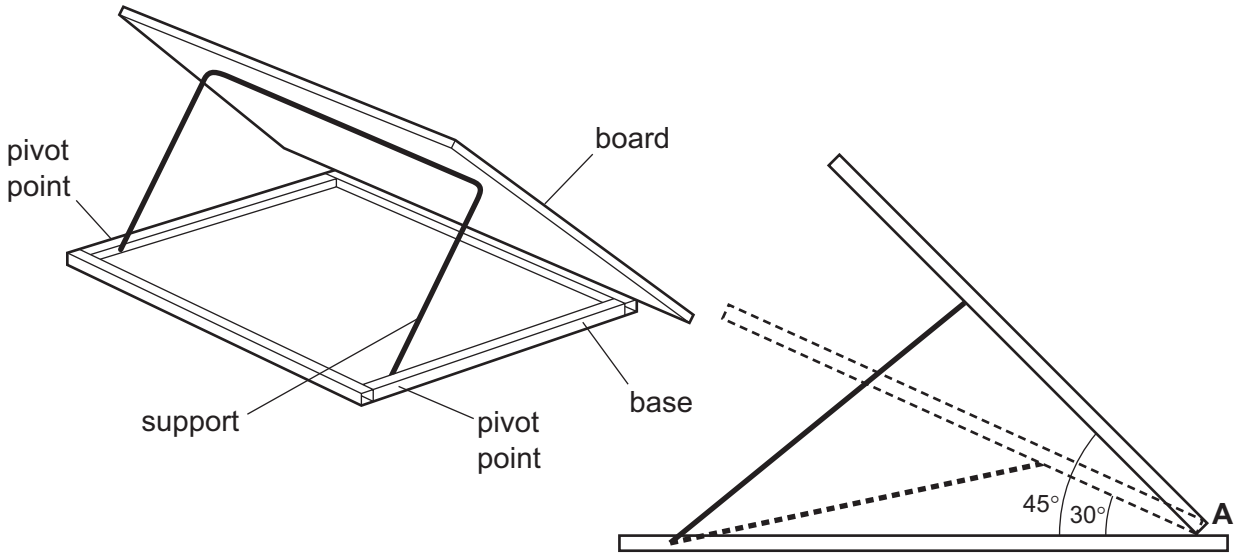


Fig. 2

(a) The base will be constructed from 20 mm square mild steel tube.
Complete the table below by naming **one** specific tool or item of equipment used in each of the stages.

Stages	Tool or item of equipment
Marking out	
Sawing to length	
Squaring sawn ends	
Testing for squareness	
Cleaning the joint	
Brazing the joint	

[6]

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(b) The board will pivot at point **A**.
Use sketches and notes to show how the board could be held against the base at **A** and allowed to pivot.
Include details of materials, fittings and fixings used.

[5]

(c) The support will be made from Ø8 non-ferrous rod.

(i) Name a suitable non-ferrous metal for the Ø8 rod.

..... [1]

(ii) Give **one** advantage of using a non-ferrous metal rather than mild steel for the support.

..... [1]

(iii) Use sketches and notes to show how the ends of the support are fitted to the base and allowed to pivot.

[2]

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(iv) Use sketches and notes to show how the support would be made from a single length of Ø8 non-ferrous metal rod.

[4]

(d) Use sketches and notes to show how the support could hold the board at angles of 30° and 45°. Include details of materials, fittings and fixings used.

[6]

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13 Fig. 3 shows a former used to vacuum form a paint palette from polystyrene sheet. The former is made from MDF.

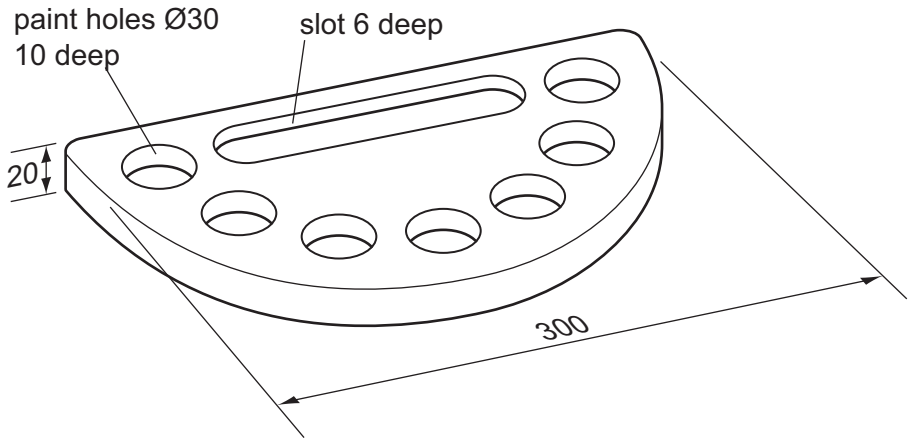


Fig. 3

(a) Give **two** reasons why MDF is more suitable than solid wood for the former.

1 ..... [1]

2 ..... [1]

(b) Describe **three** important considerations when making a former for vacuum forming.

1 ..... [1]

2 ..... [1]

3 ..... [1]

(c) Use sketches and notes to show how the former could be made from MDF.
Do **not** include details of the holes or slot.

[4]

(d) The paint holes are Ø30 × 10 deep.
Name a specific drill that can be used to cut these holes.

..... [1]

(e) Use sketches and notes to show how the 6 mm deep slot could be produced.

[5]

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(f) Use detailed sketches and notes to show how the paint palette could be vacuum formed.

[8]

(g) Sketch a modification to the design of the palette so that it could be easily held using only one hand.

[2]

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