UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
International General Certificate of Secondary Education

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

7118029958

DESIGN AND TECHNOLOGY **0445/33**

Paper 3 Resistant Materials **May/June 2011**

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	

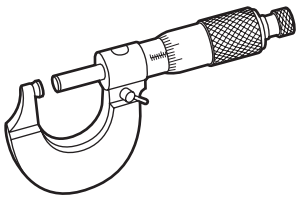
This document consists of **13** printed pages and **3** blank pages.

For Examiner's Use

Section A

Answer **all** questions in this section.

1 **(a)** Name the tool shown below.

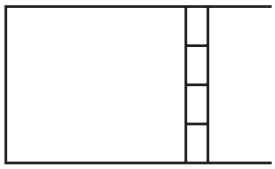


..... [1]

(b) Give **one** specific use for the tool in **(a)**.

..... [1]

2 Complete the drawing below to show a back flap hinge.



[2]

3 Fig. 1 shows views of a hanger used to hold a garden spade. The hanger is made from mild steel.

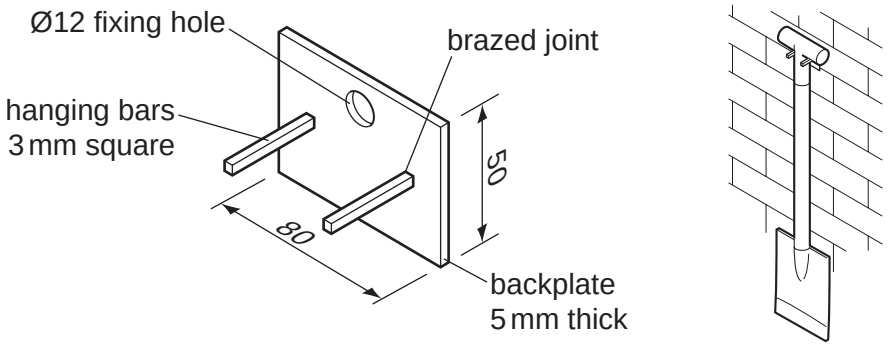


Fig. 1

Describe **two** faults in the design of the garden spade hanger and describe how the faults could be corrected.

Fault 1 ..... [1]

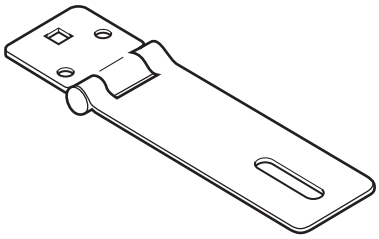
Corrected ..... [1]

Fault 2 ..... [1]

Corrected ..... [1]

For Examiner's Use

4 Complete the drawing below to show a hasp and staple fitting.

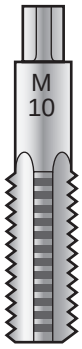


[2]

5 **(a)** Name the tools shown below.

A

.....



B

.....

[2]

(b) State the purpose of each tool.

Tool **A** ..... [1]

Tool **B** ..... [1]

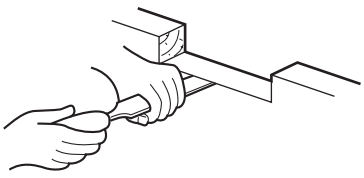
6 Name a suitable finish for the following products:

(a) the handles of a pair of electrician's pliers ..... [1]

(b) a wooden chopping board ..... [1]

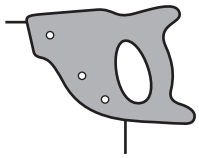
(c) a copper bracelet ..... [1]

7 Name the method of chiselling shown below.



..... [1]

8 Complete the drawing below to show a handsaw.



[2]

9 Fig. 2 shows a cross-sectional view of an injection moulding machine.

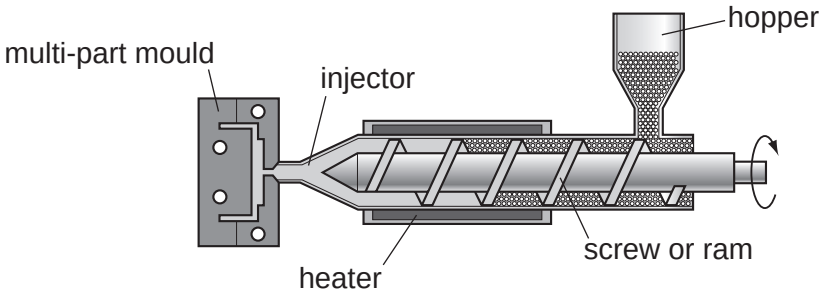


Fig. 2

Complete the table to show the stages in the injection moulding process.

Stage	Process
1	The hopper is filled with plastic granules.
2	
3	
4	
5	The mould is cooled and the moulding ejected.

[3]

10 Fig. 3 shows sheet metal being cut in a vice.

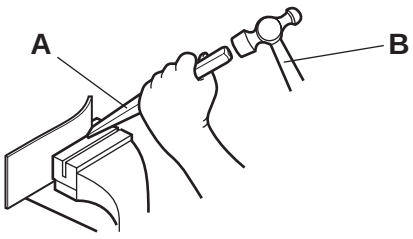


Fig. 3

Complete the statements below:

Tool **A** is a ..... chisel. [1]

Tool **B** is a ..... hammer. [1]

Section B

Answer **one** question from this section.

For Examiner's Use

11 Fig. 4 shows a toy train and trailer made mainly from beech.
The funnel is shown removed from the body of the train.

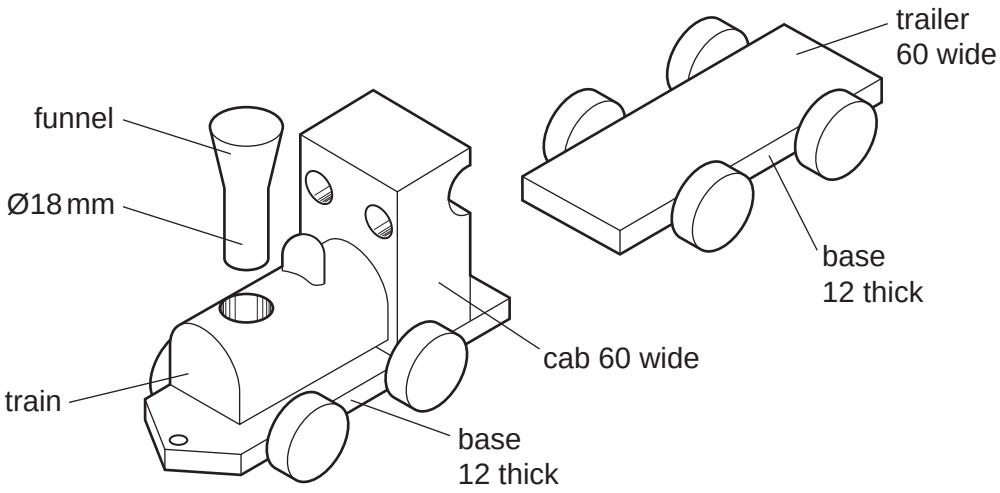


Fig. 4

(a) (i) Give **two** properties of beech that make it suitable for the toy train and trailer.

1 ..... [1]

2 ..... [1]

(ii) Many children's toys are made from plastic.
Give **two** reasons why plastic is used to make children's toys.

1 ..... [1]

2 ..... [1]

(b) Use sketches and notes to show how **one** wheel could be joined to the base of the train.

[4]

For Examiner's Use

(c) The cab shown in Fig. 5a will be made from the block of beech shown in Fig. 5b.

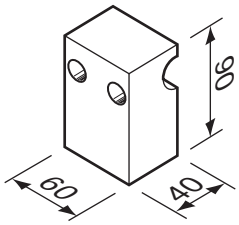


Fig. 5a

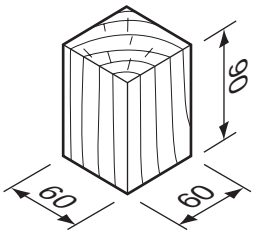


Fig. 5b

Use sketches and notes to show how the cab could be made. Include details of marking out. Name all the tools and equipment used.

[6]

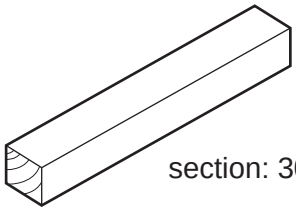
(d) The train and trailer need to be connected.
Use sketches and notes to show modifications to the design of the train and trailer so that:

- the train and trailer can easily be connected and disconnected;
- no metal components are used.

[5]

For Examiner's Use

(e) Use sketches and notes to show how you would make the funnel shown in Fig. 4 from the length of beech shown below using a wood turning lathe.



Include:

- the preparation of the material;
- a description of the wood turning process.

[6]

12 Fig. 6 shows views of a menu stand made from 3 mm thick acrylic.

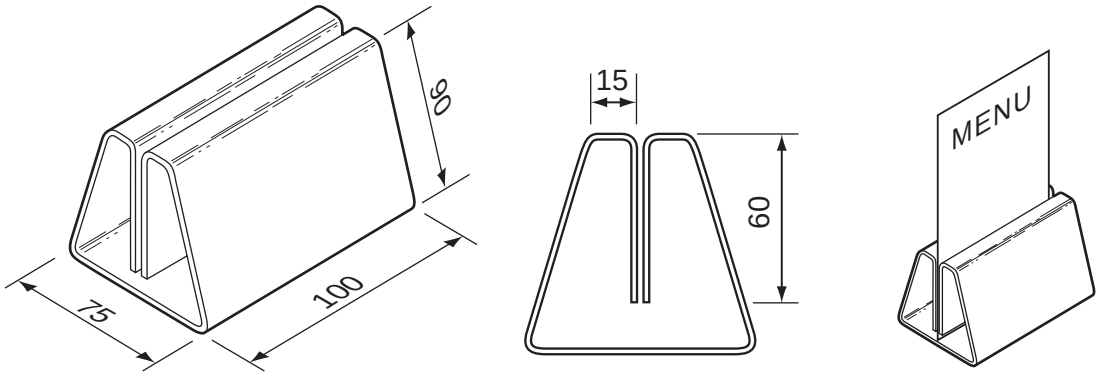


Fig. 6

(a) Complete the development (net) below to show the bend lines for the menu stand.

scale 1:3

[6]

(b) The development (net) will be cut from a larger sheet of acrylic.

(i) Name a suitable hand saw that could be used to cut out the development (net).

..... [1]

(ii) Name a suitable machine saw that could be used to cut out the development (net).

..... [1]

(iii) State **one** safety precaution you would take when using the machine saw.

..... [1]

(c) Use sketches and notes to show how the sawn edges of the acrylic could be finished to a high quality.

[4]

(d) Use sketches and notes to show how the acrylic could be bent to the shape of the menu stand. State clearly the order in which the bends would be produced.

[6]

(e) Fig. 7 shows a menu stand made from hardwood.

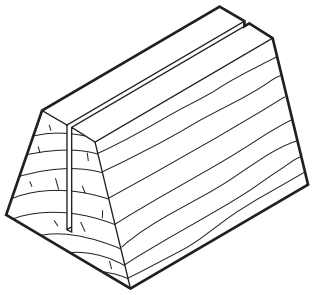
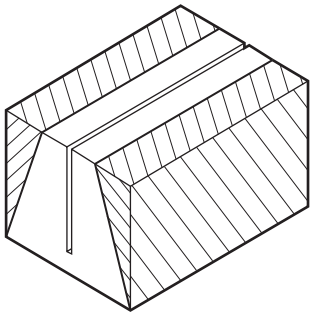


Fig. 7

The shape of the menu stand is shown below marked out on a block of hardwood.
The slot for the menu card has been cut already.



(i) Describe how a sliding bevel could be used to mark out part of the menu stand.

.....

.....

..... [2]

(ii) Use sketches and notes to show how you could produce the menu stand to the shape shown in Fig. 7.
Do not include details of making the slot.
Include details of how the hardwood block would be prepared to take a finish.

[4]

For Examiner's Use

13 Fig. 8 shows views of a trolley used to move a stack of chairs.

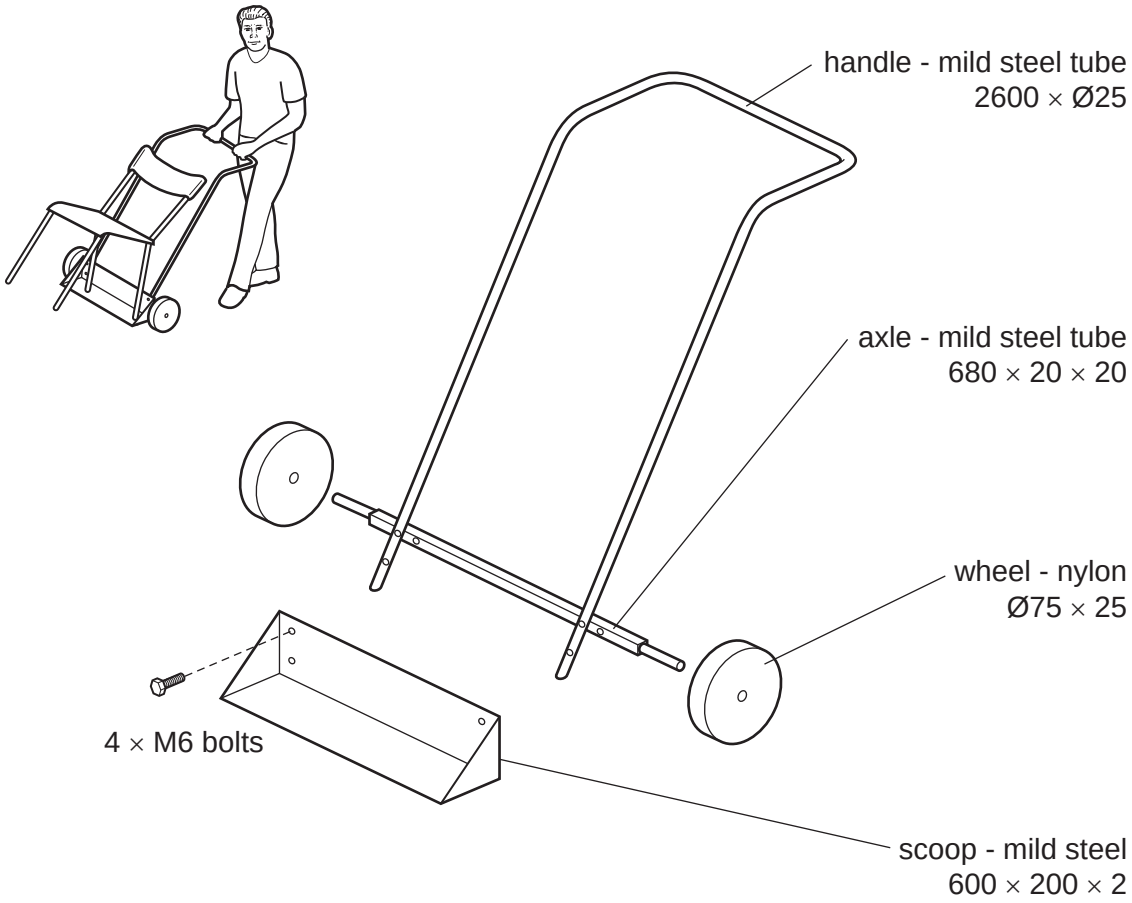


Fig. 8

(a) Use the information in Fig. 8 to complete the cutting list below.

Part	Length	Width	Thickness	Material	Number off
Handle		Ø25		Mild steel tube	1
	680	20	20	Mild steel tube	1
Scoop	600	200			1
Wheels			25	Nylon	2

[5]

For Examiner's Use

(b) Complete the development (net) of the scoop below by including:

- the tabs that will allow the shape to be riveted together;
- the lines along which the shape will be cut out;
- the positions for the four holes.

[6]

(c) Use sketches and notes to show how the development (net) of the scoop could be riveted together.
Include details of the tools and equipment used.

[6]

(d) The wheels are made from nylon.

(i) Give **one** property of nylon that makes it suitable for the wheels.

..... [1]

(ii) Name a process used to manufacture the wheels.

..... [1]

(e) The wheels will be fixed to the axle and allowed to rotate freely.
Use sketches and notes to show how **one** wheel could be fixed to the axle using:

(i) a split pin and washer;

[3]

(ii) a nut and washer.

[3]

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