

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**1956/04**

**DESIGN AND TECHNOLOGY**

**Resistant Materials Technology**

Paper 4 (Higher Tier)

**MONDAY 9 JUNE 2008**

Afternoon

Time: 1 hour 15 minutes

Candidates answer on the question paper

**Additional materials:** No additional materials are required



Candidate  
Forename

Candidate  
Surname

Centre  
Number

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Candidate  
Number

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**INSTRUCTIONS TO CANDIDATES**

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

**INFORMATION FOR CANDIDATES**

- The number of marks for each question is given in brackets [ ] at the end of each question or part question.
- The total number of marks for this paper is **50**.
- Dimensions are given in millimetres unless otherwise stated.
- Question 2, product analysis, is based on the theme of '**electrically operated drills**' printed in the specification.

FOR EXAMINER'S USE	
1	
2	
3	
4	
5	
<b>TOTAL</b>	

This document consists of **12** printed pages.

1 Fig. 1 shows a stacking chair.

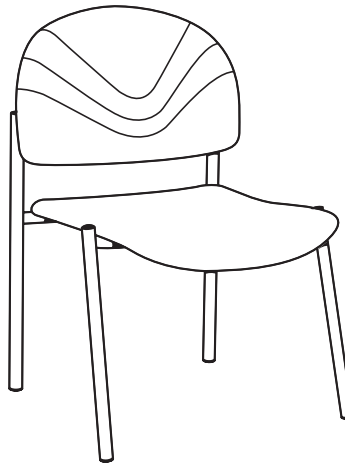


Fig. 1

(a) State **two** ways in which computer technology could be used during the design of the stacking chair.

1 ..... [1]

2 ..... [1]

(b) State **two** ways in which computer technology could be used in the marketing of the stacking chair.

1 ..... [1]

2 ..... [1]

(c) Commercially manufactured products can be made and distributed as either fully assembled products or products for 'self assembly'.

State **two** benefits to the manufacturer of producing products for 'self assembly'.

1 ..... [1]

2 ..... [1]

(d) State **two** benefits to the consumer of buying or using fully assembled products.

1 ..... [1]

2 ..... [1]

(e) During manufacture quality control checks are carried out.

Explain what is meant by quality control.

.....

.....

..... [2]

2 This question is based on the theme of ‘electrically operated drills’.

Fig. 2 shows a view of a corded electric drill.

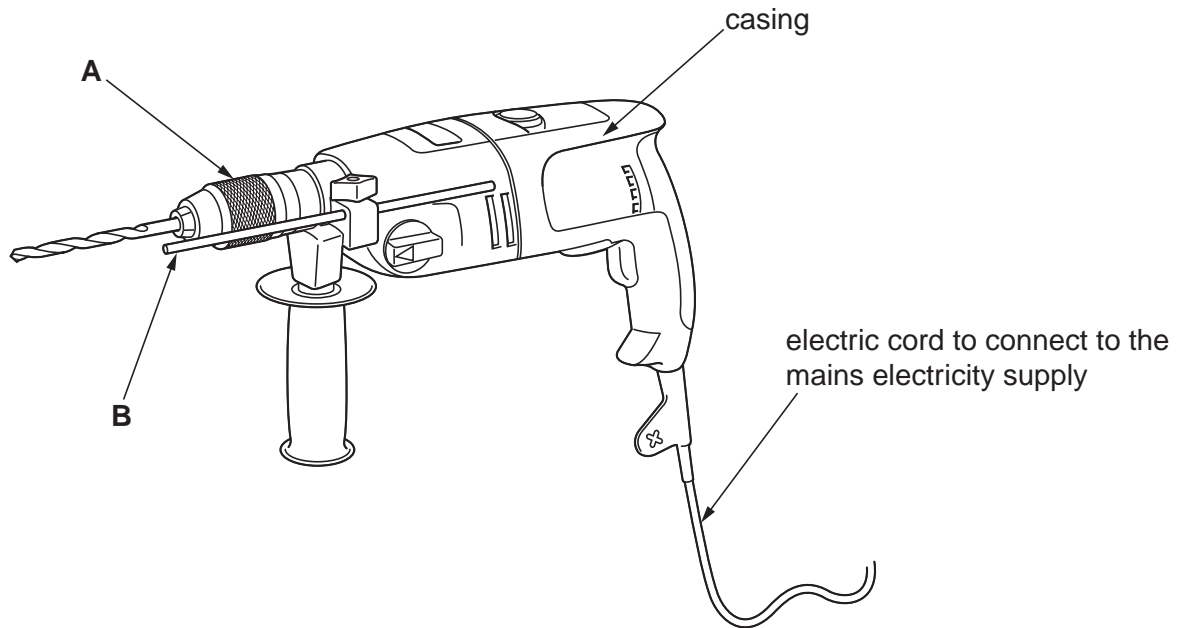


Fig. 2

(a) Name part **A** of the drill shown in Fig. 2.

..... [1]

(b) State the purpose of part **B** of the drill shown in Fig. 2.

..... [1]

(c) State **one** ergonomic feature of the design of the drill shown in Fig. 2.

..... [1]

(d) The casing of the drill in Fig. 2 is made from plastic.

Give **two** benefits of using plastic for the casing of the drill.

1 ..... [1]

2 ..... [1]

(e) Some electric drills are cordless.

Give **two** advantages of a cordless electric drill.

1 ..... [1]

2 ..... [1]

(f) Give **one** additional feature, other than those identified in parts (a) and (b), which can be found on electrically operated drills and explain its function.

Feature ..... [1]

Function .....

.....

..... [2]

- 3 Fig. 3 shows views of a signal for a model railway layout and an operating lever. The signal arm moves up and down in the direction shown.

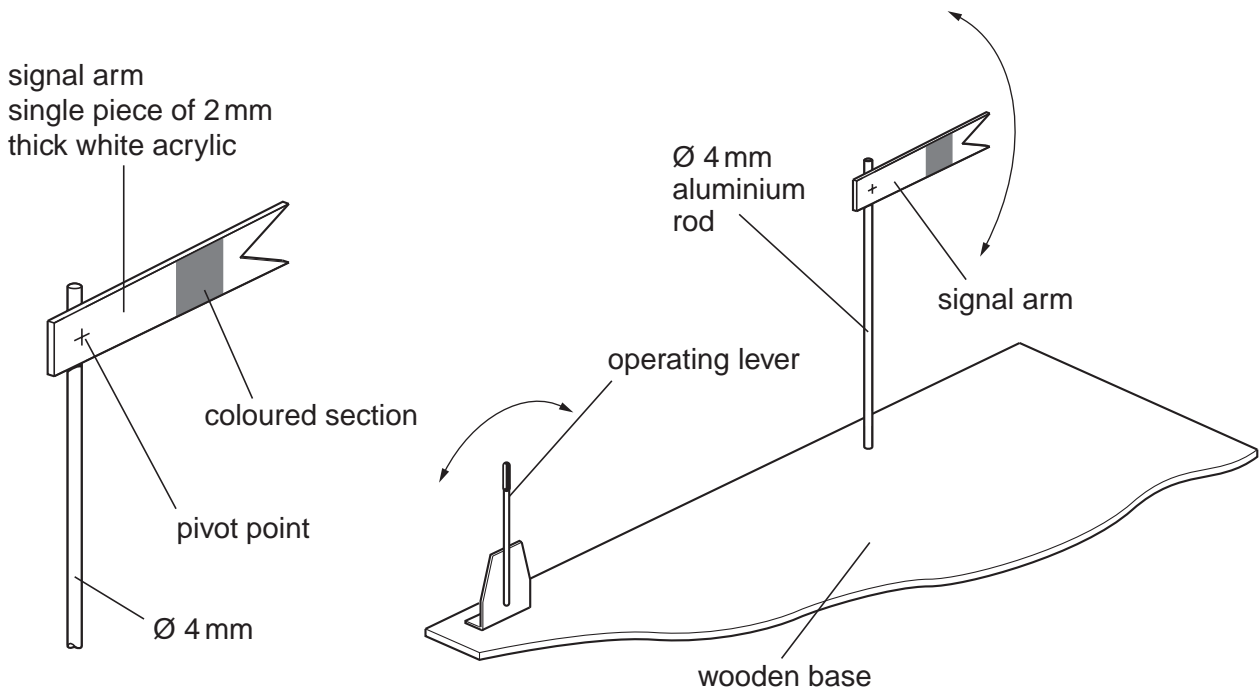


Fig. 3

- (a) Explain how the coloured section on the white acrylic signal arm could be produced.

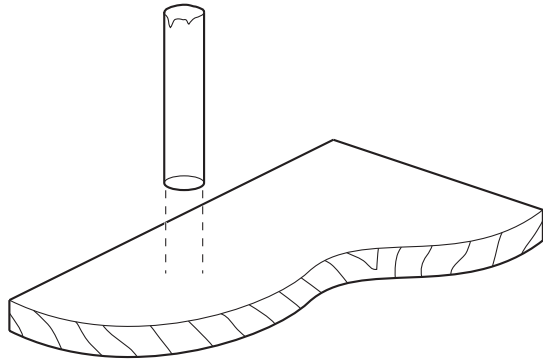
.....

.....

..... [2]

- (b) Use sketches and notes to show how the acrylic signal arm could be attached to the aluminium rod so that it moves smoothly at the pivot point.

- (c) Complete the drawing below to show how the  $\text{\O} 4$  mm aluminium rod could be securely fixed to the wooden base so that it does not rotate.



[2]

- (d) Use sketches and notes to show a suitable mechanism to operate the signal arm by means of the operating lever shown in Fig. 3.

4 Fig. 4 shows an incomplete design for a push along toy.

The toy is made mainly from beech.

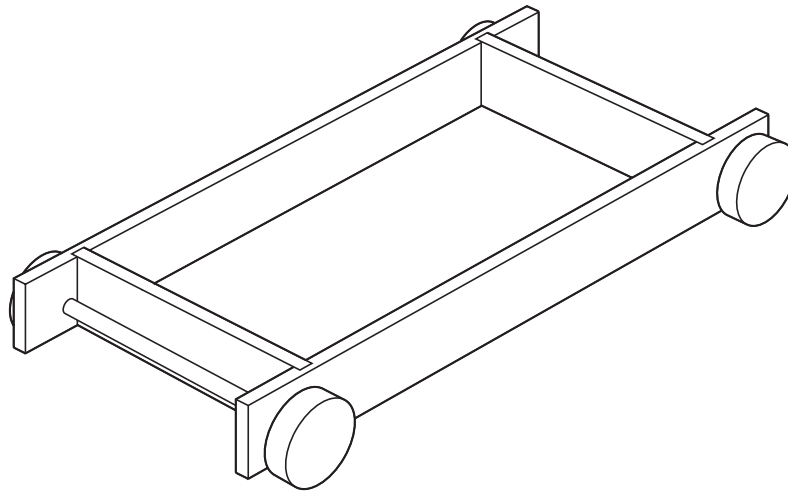


Fig. 4

Fig. 5 shows details of part of the push along toy.

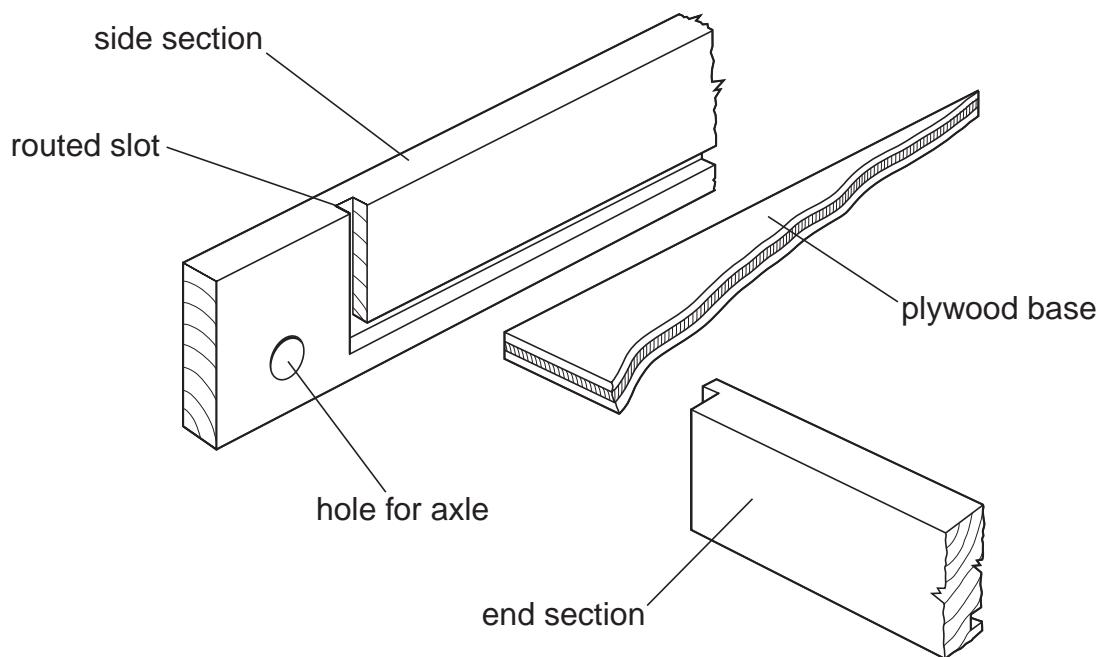


Fig. 5



- (a) Complete the risk assessment table below identifying a **different** hazard and **different** control measure for each process or activity given.

Process/Activity	Hazard	Risk Assessment	Control measure
Drilling the hole for the axle in the side sections of the toy		Medium	
Using a power router to make the slots in the side sections of the toy		High	

[2]

[2]

- (b) Use sketches and notes to design a handle for the push along toy.

The handle must be:

- height adjustable;
- fixed securely to the push along toy.

You should include details of all materials and fittings used in your design.

[6]

5 Fig. 6 shows views of a folding steel frame for a 'No Parking' sign.

The sign board is made from 3 mm acrylic sheet.

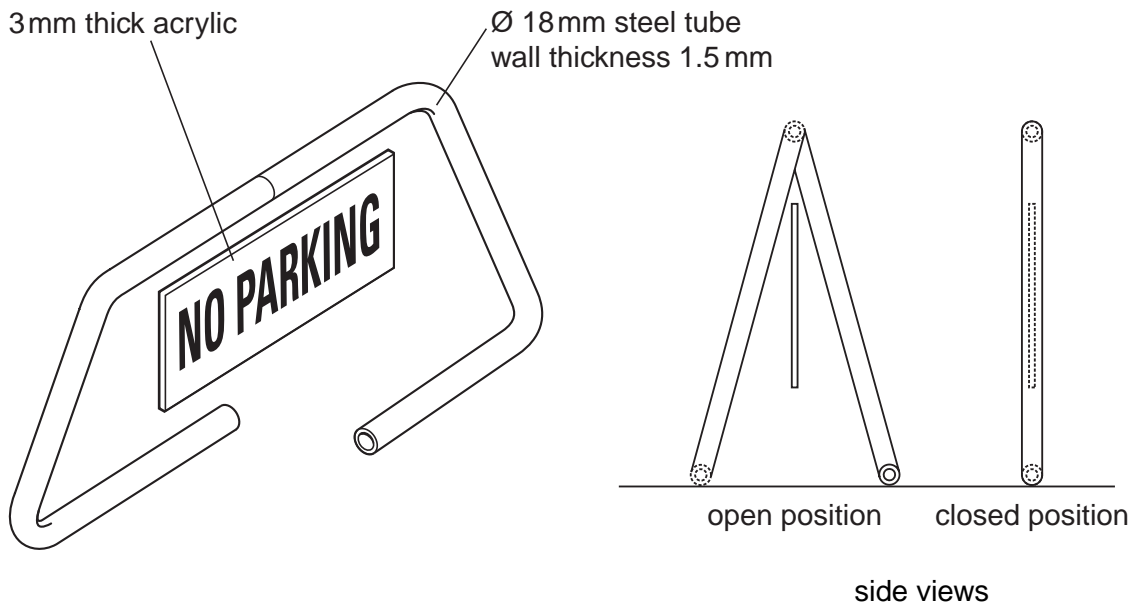


Fig. 6

(a) State **two** properties of steel that make it suitable for the folding frame shown in Fig. 6

1 ..... [1]

2 ..... [1]

(b) Use sketches and notes to show how the 3 mm thick acrylic sign board can be attached to the two parts of the steel frame so that it always hangs down vertically.

[2]

(c) Use sketches and notes to show how the two parts of the steel frame can be joined together:

- so that they can rotate to allow opening and closing as shown in Fig. 6;
- to allow the frame to rotate through  $35^\circ$  and then stop in the open position.

[6]

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