

Candidate Name

Centre Number

Candidate  
Number

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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS****General Certificate of Secondary Education****DESIGN AND TECHNOLOGY  
(RESISTANT MATERIALS TECHNOLOGY)****1956/4****PAPER 4 HIGHER TIER****Specimen Paper 2003**

1 hour 15 minutes

Candidates answer on the question paper.

**TIME** 1 hour 15 minutes**INSTRUCTIONS TO CANDIDATES**

Write your name, Centre number and candidate number in the spaces at the top of this page.

Answer **all** questions.

Write your answers in the spaces provided on the question paper.

**INFORMATION FOR CANDIDATES**

The number of marks is given in brackets [ ] at the end of each question or part question.

Dimensions are given in mm unless stated otherwise.

Question 2, product analysis, is based on the theme 'Garden Furniture' printed in the specification.

Total marks for this paper is **50**.

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

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**This specimen question paper consists of 11 printed pages and 1 blank page.**

- 1 Fig. 1 shows a TV and Hi-Fi unit made from a manufactured board with a spray painted finish. The unit will be produced as a flat pack ready for home assembly from the lengths of manufactured board shown.

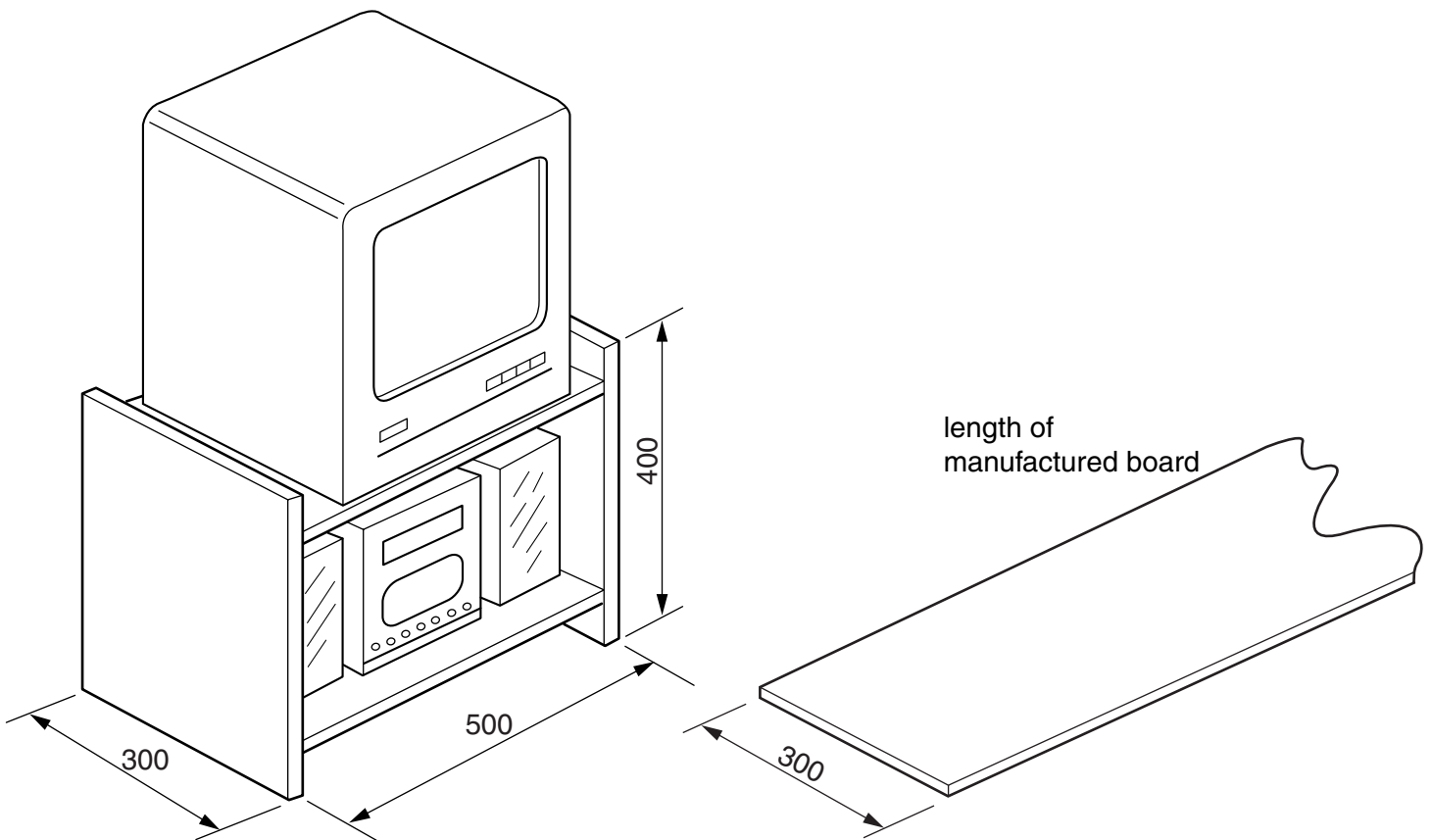


Fig. 1

- (a) State **two** advantages of using robots to apply the spray paint finish.

1 \_\_\_\_\_ [1]

2 \_\_\_\_\_ [1]

- (b) Explain how the use of manufactured boards rather than solid wood to produce furniture can help the environment.

\_\_\_\_\_  
\_\_\_\_\_  
[2]

- (c) Name and sketch a knock-down (K-D) fitting suitable for joining any parts of the unit together.

[3]

- (d) The table below gives two of the stages involved in producing the TV and Hi-Fi unit. Complete the table.

Stage	Process
1	Cut the sides, top and shelf to length
2	
3	
4	
5	Package unit ready for sale

[3]

2 This question is based on the theme “Garden Furniture”.

Fig. 2 shows two chairs suitable for use in a garden.

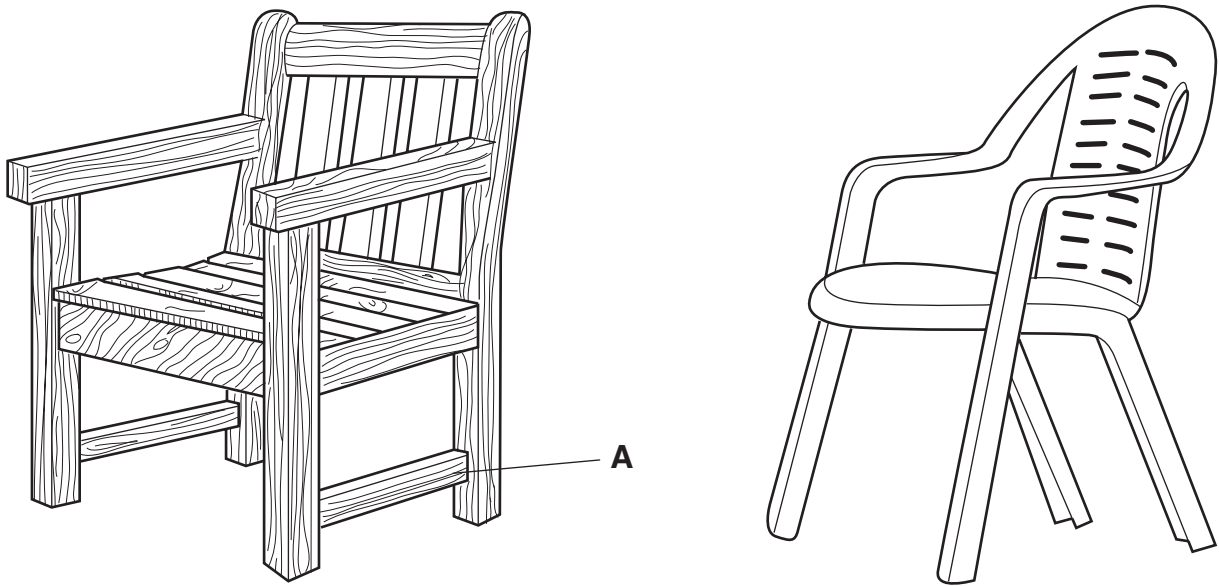


Fig. 2

(a) (i) Name a solid wood suitable for outdoor use.

\_\_\_\_\_ [1]

(ii) Name a suitable construction that could be used to join the leg and rail at A.

\_\_\_\_\_ [1]

(b) (i) State **two** reasons why a consumer might choose to buy the wooden chair.

1 \_\_\_\_\_ [1]

2 \_\_\_\_\_ [1]

(ii) State **two** reasons why a consumer might choose to buy the plastic chair.

1 \_\_\_\_\_ [1]

2 \_\_\_\_\_ [1]

(c) Explain how anthropometric data would have been used in the design of both chairs.

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[2]

(d) Use notes and sketches to describe **one** improvement you would make to the design of **either** the plastic **or** wooden chair.

[2]

3 Fig. 3 shows a calculator.

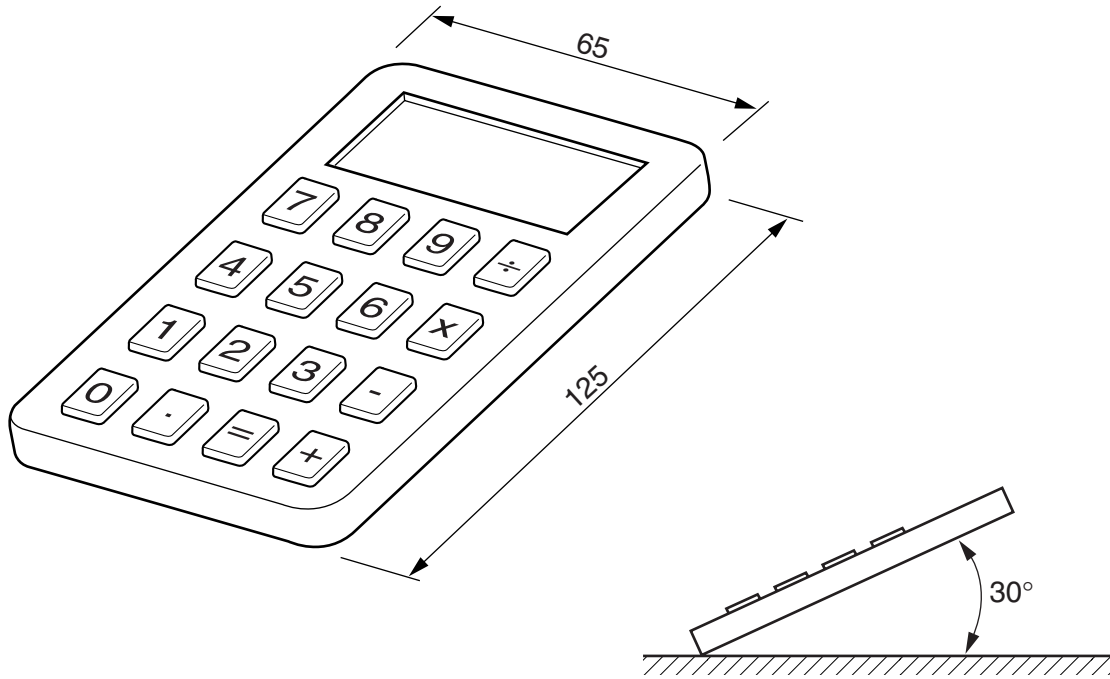


Fig. 3

There can be problems using the calculator and reading the display when it is resting on a polished table. A design is required for a stand that will support the calculator securely at an angle of  $30^\circ$  on a polished table.

(a) Write a specification to include **three** additional considerations for the proposed stand.

The calculator stand must:

- 1 support the calculator at an angle of  $30^\circ$ .
- 2 \_\_\_\_\_ [1]
- 3 \_\_\_\_\_ [1]
- 4 \_\_\_\_\_ [1]

**(b)** Use notes and sketches to design a stand for the calculator.

Show clearly how your design meets your specification.

Include details of materials, constructions or processes and the main sizes.

[7]

4 Figs. 4 and 5 show a trailer to be pulled behind a bicycle.

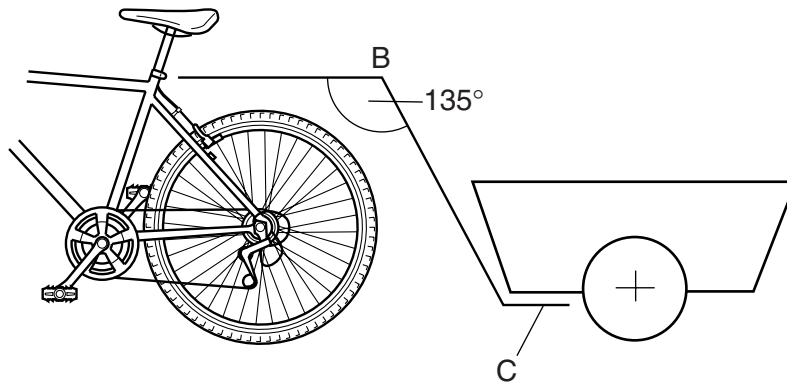


Fig. 4

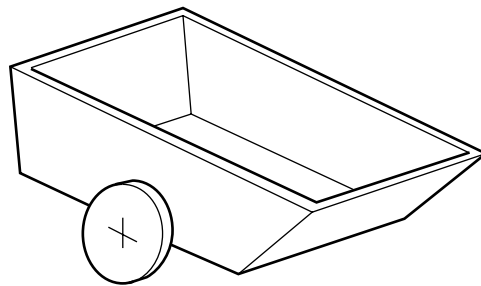


Fig. 5

(a) State **one** reason why you would choose a manufactured board rather than a solid wood to make the trailer box.

\_\_\_\_\_ [1]

(b) Mass produced trailer boxes could be made from plastic.  
Name a suitable plastic and manufacturing process.

Plastic \_\_\_\_\_ [1]

Process \_\_\_\_\_ [1]



(c) The towing bar is made from a single piece of mild steel tube as shown in Fig. 6.



**Fig. 6**

The table below gives two of the stages involved in making the angled joint at B in Fig. 6.

Complete the table.

Stage	Process
1	Mark out the angles on steel tube
2	
3	
4	
5	Clean up joint ready to apply finish

[3]

(d) The square tube needs to be modified to allow it to be connected to the trailer box at C in Fig. 4.

The base of the trailer box is made from 9 mm thick manufactured board.

(i) Show clearly a modification to the square tube so that it could be secured to the base of the trailer box.

[3]

(ii) Explain why the modification is necessary.

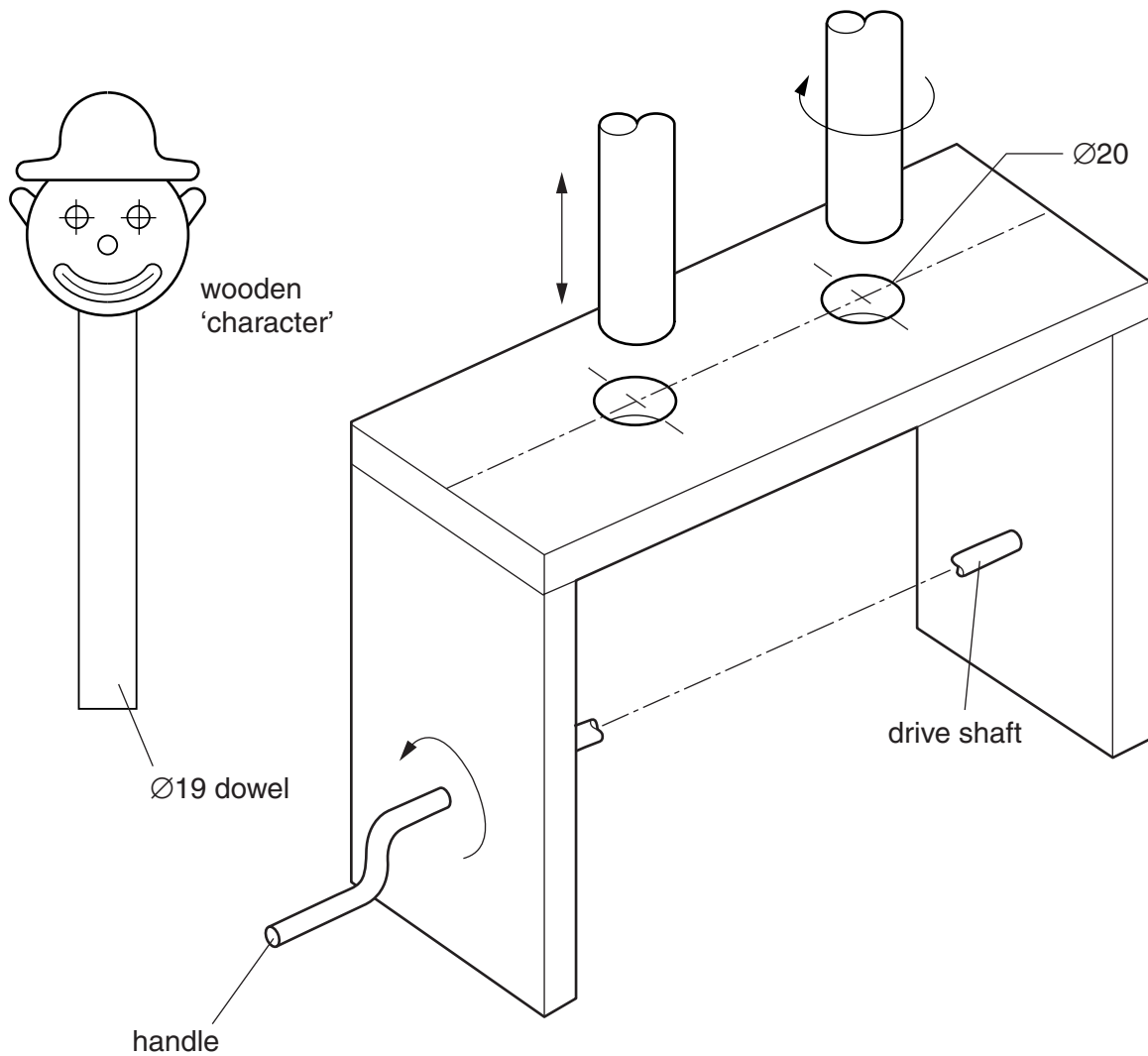
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[1]

- 5 Fig. 7 shows an incomplete drawing of a mechanical toy. When the handle is turned the wooden characters move independently of each other. The toy will be used as a teaching aid to demonstrate different mechanisms and movement.



**Fig. 7**

- (a) Explain why this toy would be unsuitable as a commercially produced children's toy.

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[2]

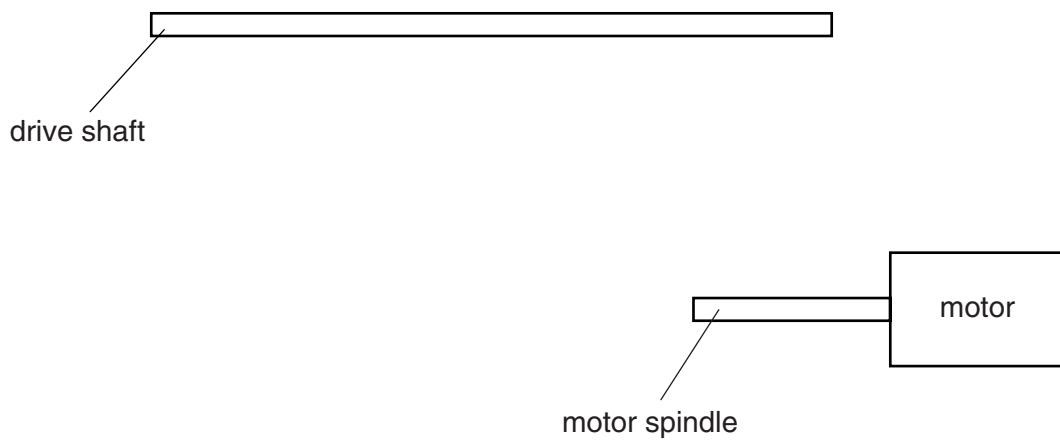
- (b) Complete the pictorial view of the mechanical toy shown in Fig. 7 by adding details of the mechanisms that will cause the wooden characters to move as indicated when the handle is rotated as shown. [5]

(c) The drive shaft in Fig. 8 could be driven by a small motor.

(i) Name a transmission system that could connect the motor to the drive shaft.

\_\_\_\_\_ [1]

(ii) Draw on Fig. 8 to show clearly how the drive shaft could be made to turn much slower than the motor spindle.



**Fig. 8**

[2]

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