

OXFORD CAMBRIDGE AND RSA EXAMINATIONS

General Certificate of Secondary Education

**D&T: RESISTANT MATERIALS
TECHNOLOGY**



1956/3

PAPER 3 FOUNDATION TIER

Wednesday

14 JUNE 2006

Afternoon

1 hour

Candidates answer on the question paper.
No additional materials are required.

Candidate
Name

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Centre
Number

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Candidate
Number

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TIME 1 hour

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.
- Do not write in the bar code. Do not write in the grey area between the pages.
- **DO NOT WRITE IN THE AREA OUTSIDE THE BOX BORDERING EACH PAGE. ANY WRITING IN THIS AREA WILL NOT BE MARKED.**

INFORMATION FOR CANDIDATES

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

Dimensions are given in millimetres unless stated otherwise.

Question 5, product analysis, is based on the theme ‘**Mechanical Reachers**’ printed in the specification.

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

FOR EXAMINER'S USE	
Question 1	
Question 2	
Question 3	
Question 4	
Question 5	
TOTAL	

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

- 1 Fig. 1 shows a rack made from solid wood. The parts of the rack are glued and pinned together.

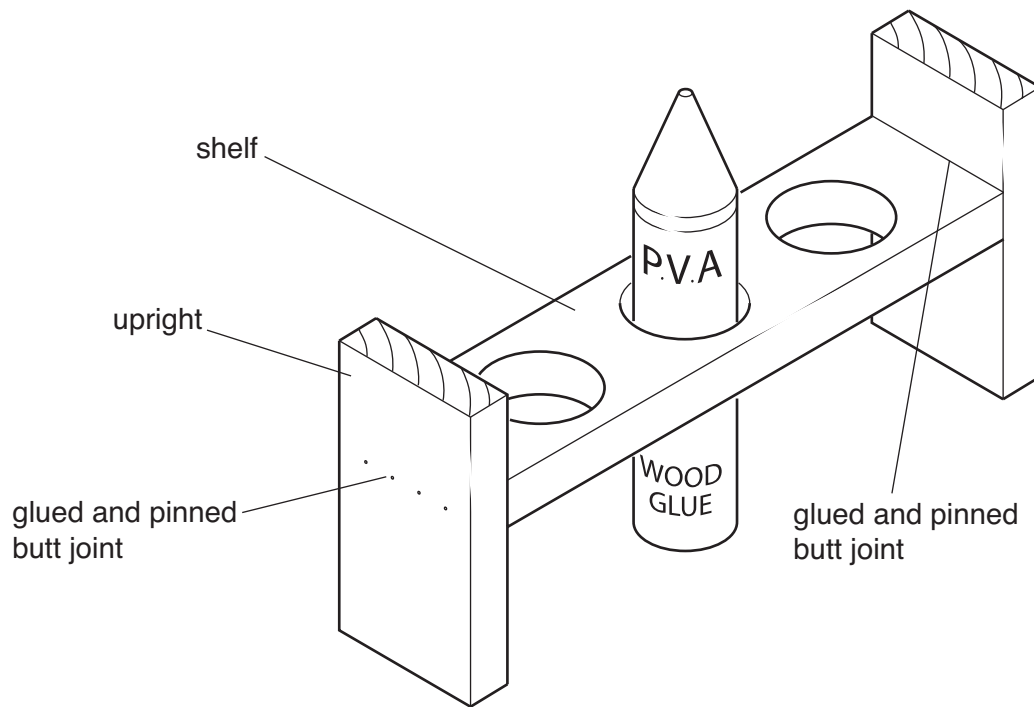
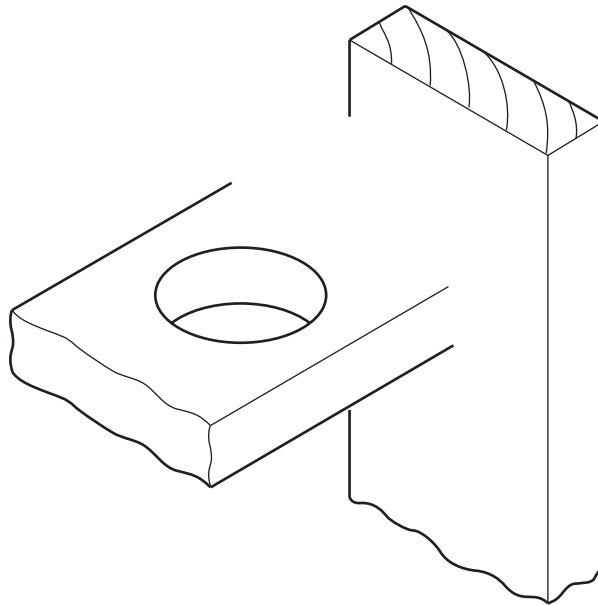


Fig. 1

- (a) The butt joints of the rack are very weak.
- (i) Complete the drawing below to show a stronger joint.



[2]

- (ii) Name the joint that you have drawn in part (a)(i).

[1]

(b) The rack is to be varnished before being used.

State **two** reasons for applying varnish to the rack.

1 _____ [1]

2 _____ [1]

(c) Complete the table by naming the tool or item of equipment used for each process.
Stage 2 has been done for you.

Stage	Process	Name of tool or item of equipment
1	Smooth the surfaces of the rack	
2	Apply the varnish	Brush
3	Clean the varnish brush	

[2]

(d) When the rack is picked up the bottles of glue fall out.

Use sketches and notes to show how the rack could be changed so that the bottles do not fall out.

- 2 Fig. 2 shows an incomplete design for a musical toy. When the keys are hit with the hammer they make a musical note. Not all of the keys have been shown.

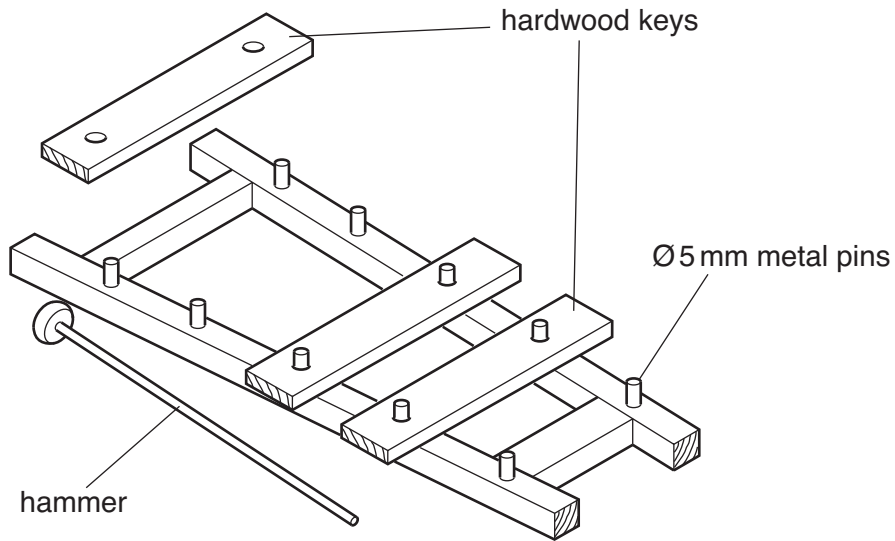


Fig. 2

- (a) The keys are marked out and cut from a long length of hardwood shown in Fig. 3.

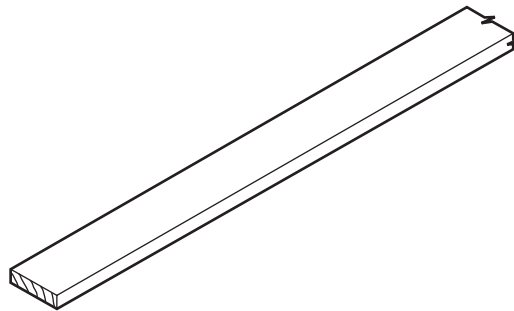


Fig. 3

Complete the table below by naming the tool or item of equipment used for each process.

Stage	Process	Name of tool or item of equipment
1	Marking the lines across the hardwood	[1]
2	Holding the material when sawing	[1]
3	Sawing the keys to length	[1]

- (b) State a suitable drill size for the holes in the hardwood keys.

(c) When the toy is moved the hardwood keys fall off of the metal pins.

State **two** ways in which the keys could be held in place on the metal pins.

1 _____

2 _____ [2]

(d) Use sketches and notes to show how the hammer could be stored **on** the musical toy when not being played.

The hammer must:

- not fall off when the toy is moved;
- be easy to remove.

3 Fig. 4 shows a design for a bird feeder made from one piece of acrylic sheet.

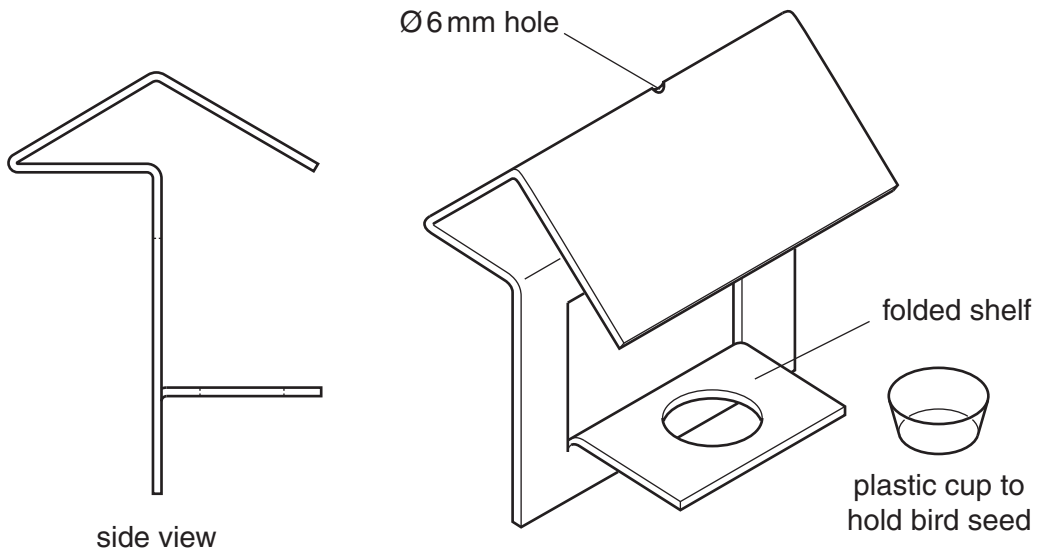


Fig. 4

(a) State **two** properties of acrylic that make it suitable for this bird feeder.

1 _____ [1]

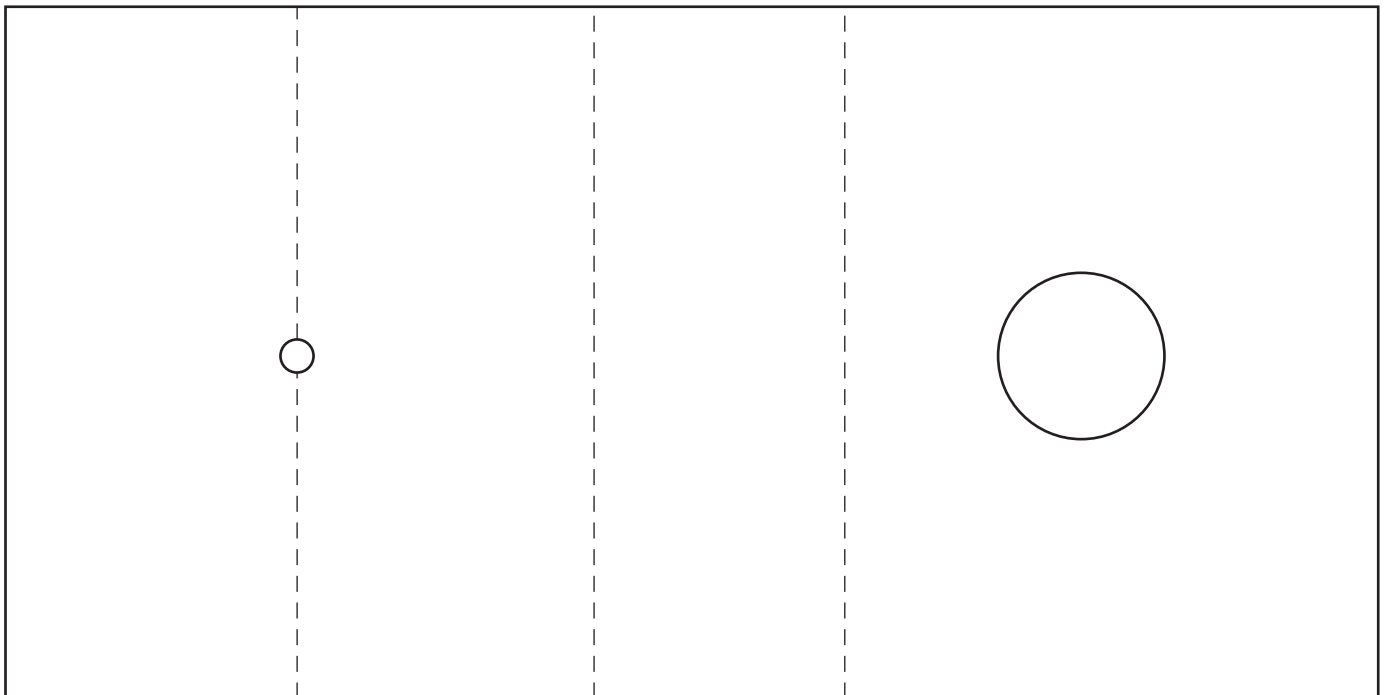
2 _____ [1]

(b) An incomplete development (net) for the bird feeder is shown below.

Complete the development (net) by adding the **three** cut lines and the bend line for the shelf.

————— cut line

----- bend line



[2]

(c) Complete the table by describing the **three** processes in making the shelf.

Process	Description
Cutting	
Bending	
Finishing	

[3]

(d) Fig. 5 shows views of the bird feeder hanging from the branch of a tree.

Add sketches and notes to Fig. 5 to show a method of attaching the aluminium hook to the bird feeder.

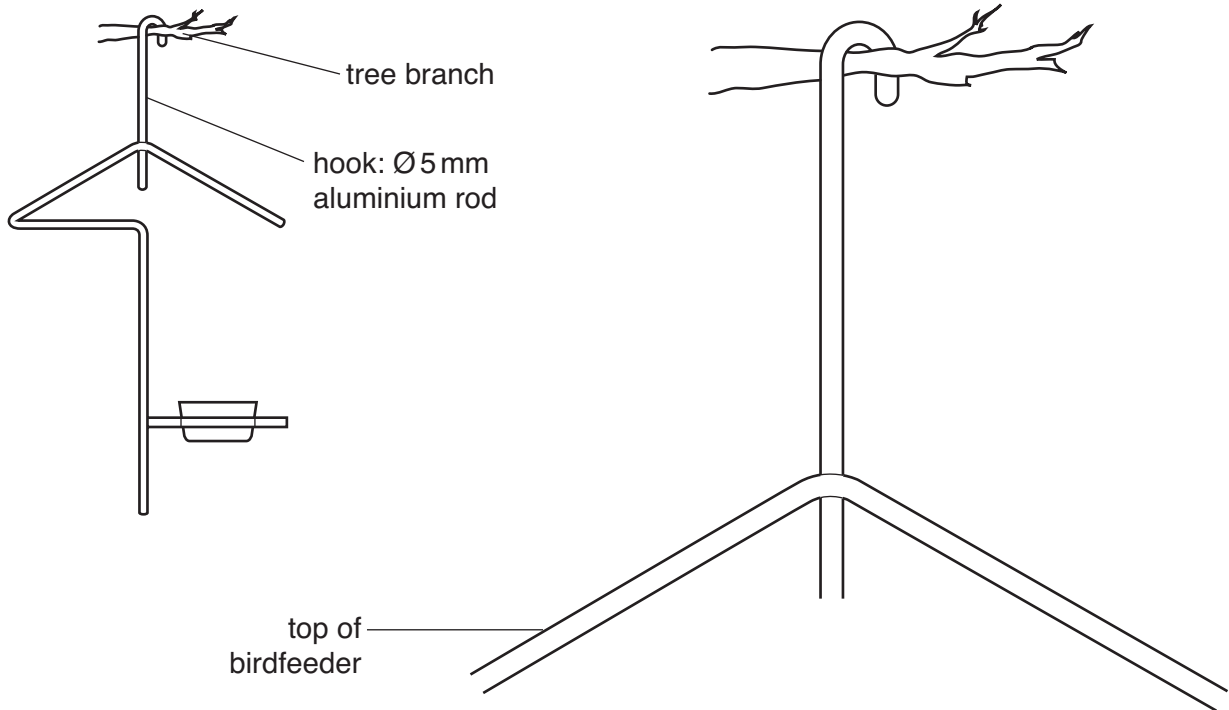
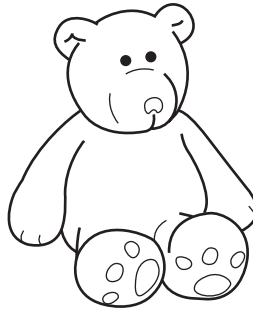
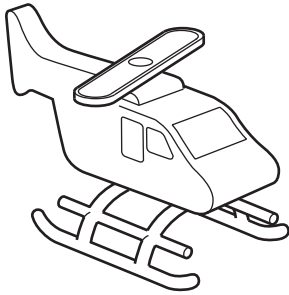


Fig. 5

[3]

[Turn over

- 4 Manufacturers produce childrens' toys in quantity. The designer uses a design brief to meet the requirements of the need, the user and the potential market.



- (a) In the table below tick (✓) **one** statement that would be the most suitable design brief for a toy manufacturer.

Design Brief	✓
Design a brightly coloured and safe toy for my own use.	
Design an educational toy suitable for children between the ages of 3 and 5 years old that could be batch produced.	
Design a red lorry with four wheels suitable for boys.	
Design and make a toy suitable for young children.	

[1]

- (b) Add **two** further specification points for a child's toy.

- The toy should be attractive to girls and boys.
- The toy should be able to be batch produced.

• _____ [1]

• _____ [1]

(c) Give **two** reasons why a designer would use a prototype model of a new toy design before manufacturing a toy in quantity.

1 _____ [1]

2 _____ [1]

(d) A risk assessment would be carried out before manufacturing toys in quantity.

Explain the purpose of a risk assessment.

_____ [2]

(e) Jigs are used when manufacturing toys in quantity.

Give **two** benefits to the manufacturer of using jigs when manufacturing toys in quantity.

1 _____ [1]

2 _____ [1]

(f) Manufactured products are tested and evaluated.

Describe **one** test that could be carried out on a child's toy.

_____ [1]

- 5 This question is based on the theme of 'Mechanical Reachers'.
Fig. 6 shows a view of a handheld mechanical reacher.

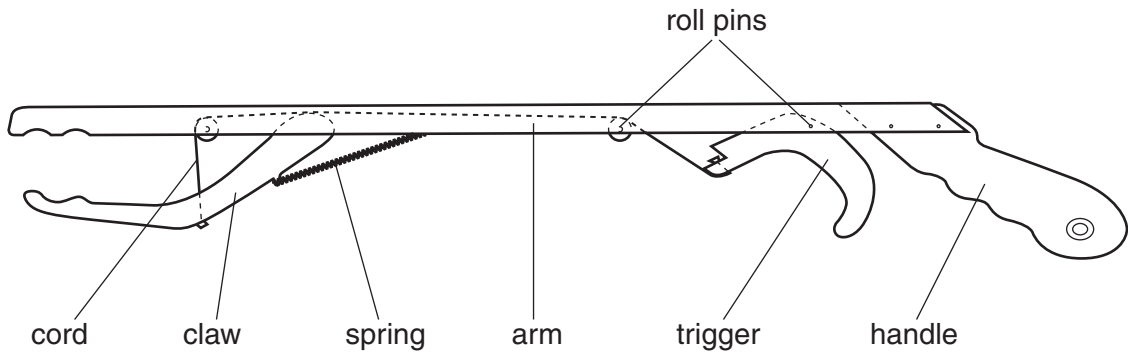


Fig. 6

The arm of this design of reacher is made from metal.

- (a) Name a suitable metal for the arm of the reacher.

_____ [1]

- (b) State **one** property of the metal named in part (a) which makes it suitable for reachers.

_____ [1]

- (c) Identify **two** different user groups who might use a handheld reacher.

1 _____ [1]

2 _____ [1]

- (d) Some types of reacher are designed to fold.

Give **two** advantages to the user of a folding design.

1 _____

_____ [1]

2 _____

_____ [1]

- (e) The handle, trigger, and claw of the reacher shown in Fig. 6 are all held in position by roll pins.

Give **one** reason why this type of fixing is used.

_____ [1]

(f) Fig. 7 shows details of the “claw” mechanism of the reacher.

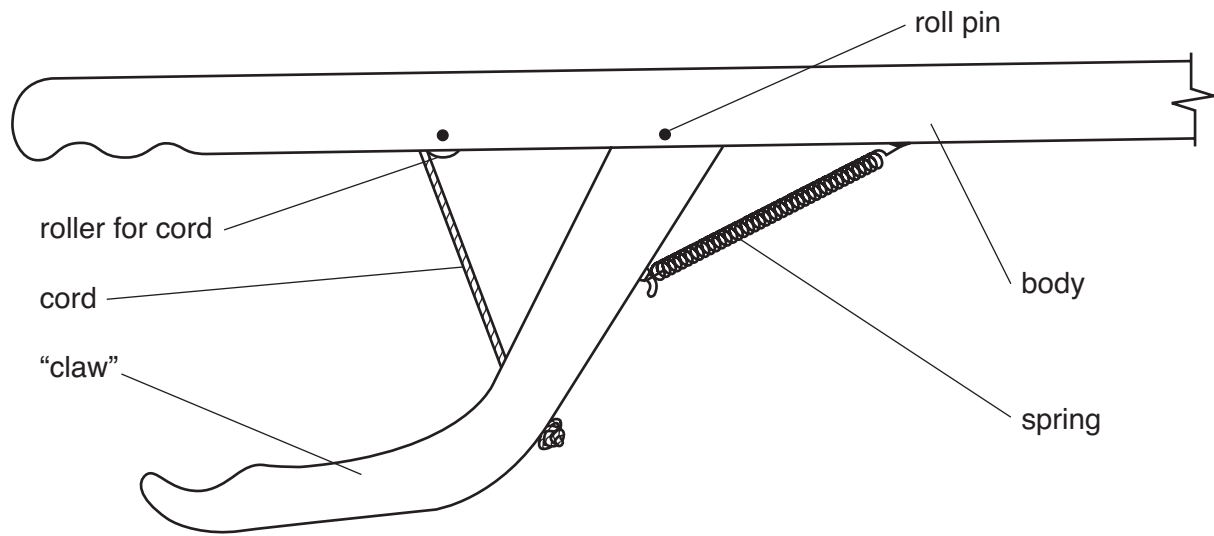


Fig. 7

Use sketches and notes to show a modification to the claw mechanism which would allow the claw to close with less movement of the trigger.

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