

Candidate Name	Centre Number	Candidate Number



**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**General Certificate of Secondary Education**

**DESIGN & TECHNOLOGY:**  
**INDUSTRIAL TECHNOLOGY**

**1959/4**

PAPER 4 Higher Tier

Thursday      **16 JUNE 2005**      Afternoon      1 hour 15 minutes

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

**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.

All dimensions are in millimetres.

Assume any mechanical system to be 100% efficient.

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

---

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

- 1 Fig. 1 shows a design for a new mobile telephone .

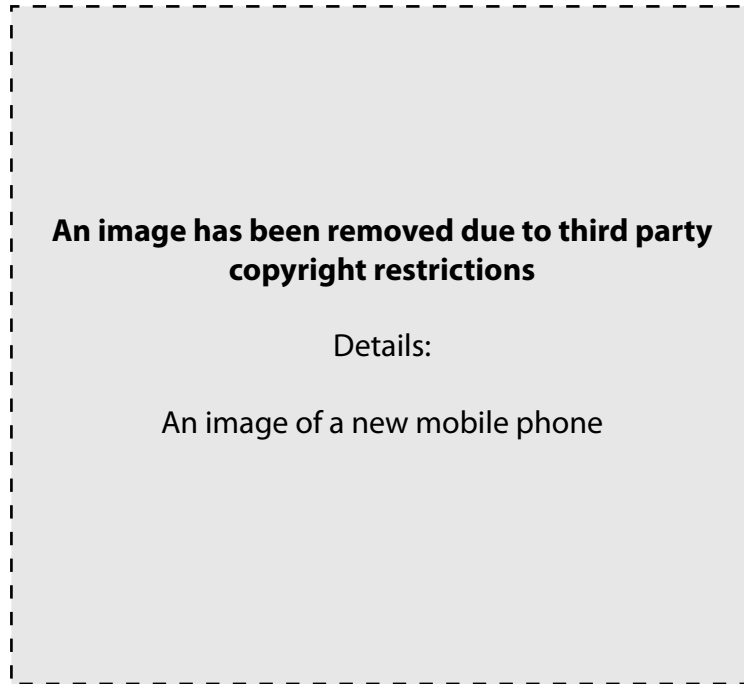


Fig. 1

- (a) The mobile telephone has been designed using a CAD package.

Complete the table by describing each CAD menu term.

Grab/Select	
Group/Ungroup	
Drag/Move	
Copy/Paste	

[8]

- (b) State **two** ways in which computer generated designs can be stored electronically.

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

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

- 2 Fig. 2 shows two views of a pocket plastic comb and mirror set. It is the size of a credit card and 5mm thick.

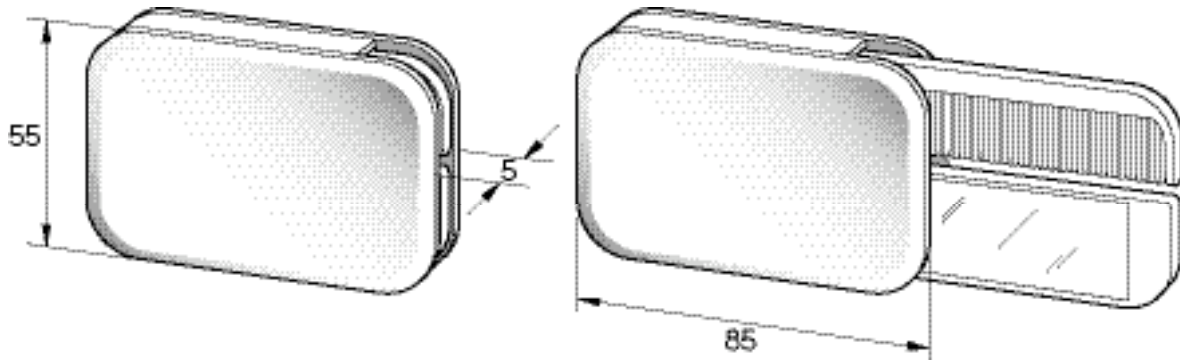


Fig. 2

- (a) Name a suitable thermoplastic and manufacturing process for the production of the comb.

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

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

It has been found that the comb and mirror fall out of the case easily when it is in a pocket or handbag.

- (b) Using notes and sketches, show a design modification that will help keep the comb and mirror inside until needed.

The overall size of the case should not change.

[3]

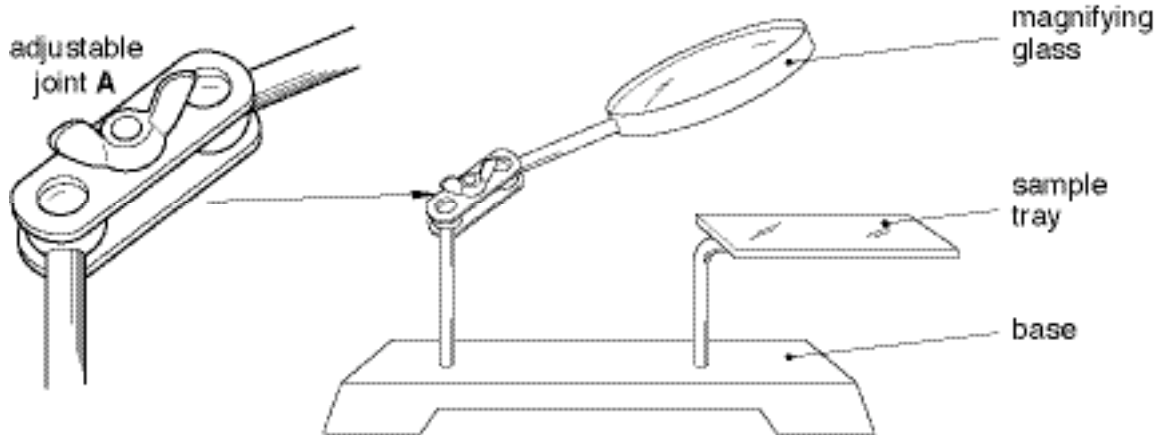
The manufacturers have decided to design and manufacture a credit card sized tool set.

(c) Use notes and sketches to show a design for the set with the following specification points:

- credit card sized case 5mm thick;
- to include a screwdriver, tape measure, small file;
- all tools are held securely until needed.

[5]

- 3 Fig. 3 shows views of an adjustable magnifying glass and sample tray used by people working with very small components, such as model kit parts.



**Fig. 3**

- (a) (i) State why the magnifying glass needs to be adjustable.

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

- (ii) State why the base needs to be heavy.

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

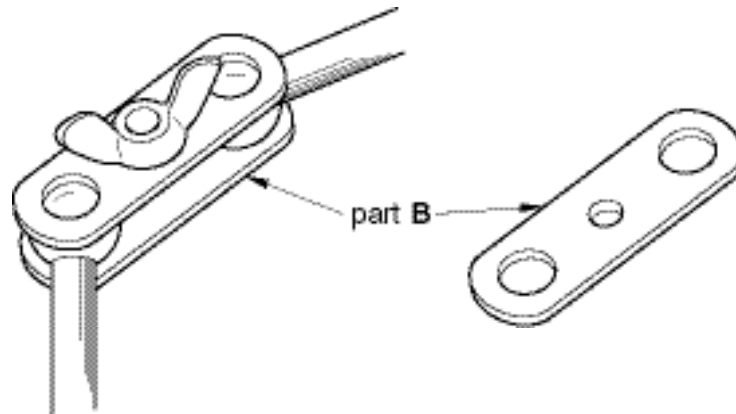
- (iii) State why the sample tray needs to be horizontal.

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

- (b) Using notes and sketches, show how the sample tray can be made so that it is adjustable in height and remains horizontal.

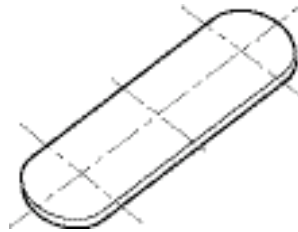
[3]

Fig. 4 shows adjustable joint **A** and one of its component parts.



**Fig. 4**

Fig. 5 shows a blank part **B**.  
A batch of 100 is required.



**Fig. 5**

(c) Using notes and sketches, design a drilling jig that will allow:

- component **B** to be easily and quickly located into position;
- component **B** to be securely held on the drilling table;
- drilling of each hole;
- an accurate and consistent quality for all 100 components.

- 4 Fig. 6 shows a novelty storage box.

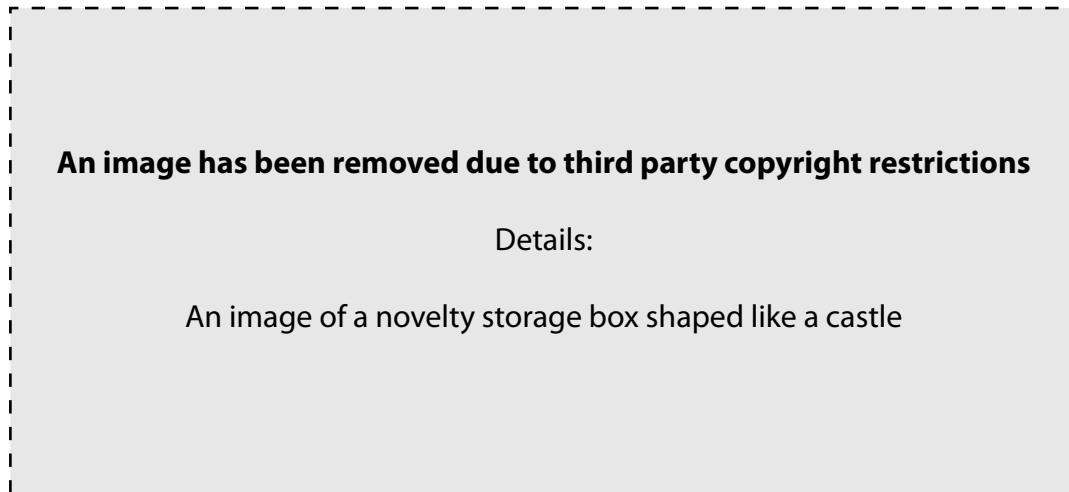


Fig. 6

Both the lid and the base have been vacuum formed in 5mm High Impact Polystyrene (HIPs).

- (a) State two reasons why this is a suitable material for the product.

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

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

- (b) There is a fault in the design. The lid does not stay on the box when it is moved or stored.

Using notes and sketches, show a design modification that will allow the lid to locate firmly and securely on the base.

[4]



- (c) Using notes and sketches, design the mould needed to successfully vacuum form the lid of the novelty storage box.

[4]

5 Designers and manufacturers test materials before using them to make products.

(a) Explain why it is important to test materials.

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

(b) Give **two** different methods for testing the physical properties of materials other than for hardness.

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

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

Materials are often tested on a test rig.

(c) Use notes and sketches to show a design for a test rig for a hardness test.

[4]

Thermo chromic paint can be applied to products.

(d) Describe a simple method for testing the efficiency of thermo chromic paint.

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



---

Permission to reproduce items where third-party owned material protected by copyright is included has been sought and cleared where possible. Every reasonable effort has been made by the publisher (OCR) to trace copyright holders, but if any items requiring clearance have unwittingly been included, the publisher will be pleased to make amends at the earliest possible opportunity.

OCR is part of the Cambridge Assessment Group. Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.