

Centre Number	Candidate Number	Name
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CAMBRIDGE INTERNATIONAL EXAMINATIONS  
International General Certificate of Secondary Education

**DESIGN AND TECHNOLOGY**  
**DESIGN AND COMMUNICATION**

**0445/01**  
**0446/01**

Paper 1 Common Core

October/November 2003

**1 hour 45 minutes**

Additional Materials: A3 Drawing paper  
Standard drawing equipment

**To be taken together with the optional paper for which you have been entered in one session of 2 hours 45 minutes.**

**READ THESE INSTRUCTIONS FIRST**

Write your name, centre number and candidate number in the spaces at the top of this page and on all separate answer paper used.

Write in dark 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.

**Part A**

Answer **all** questions.

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

**Part B**

Answer **one** question.

Write or draw your answer on A3 drawing paper provided.

At the end of the examination, fasten all your work securely together.

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

You may use a calculator.

If you have been given a label, look at the details. If any details are incorrect or missing, please fill in your correct details in the space given at the top of this page.

Stick your personal label here, if provided.

For Examiner's Use	
<b>Part A</b>	
<b>Part B</b>	
<b>TOTAL</b>	

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

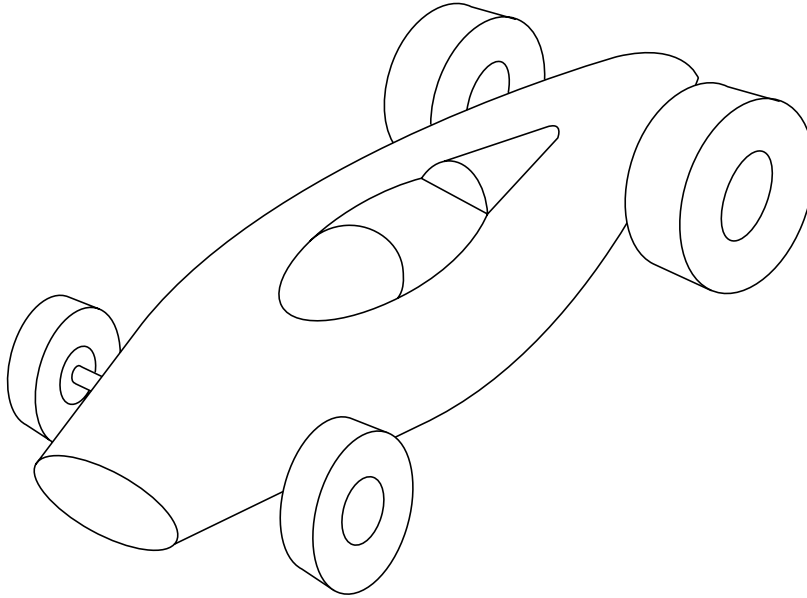


**Part A**

Answer **all** questions in the spaces provided.

1 Fig. 1 shows a vacuum formed model car.

Colour and/or shade the car to show that it is made from a plastic material.



**Fig. 1**

[6]

2 (a) State **two** ways in which wood dust can be a health hazard.

1. .... [1]

2. .... [1]

(b) State **two** ways in which the risks from wood dust can be reduced.

1. .... [1]

2. .... [1]

3 (a) Name **two** methods of joining metals by using heat.

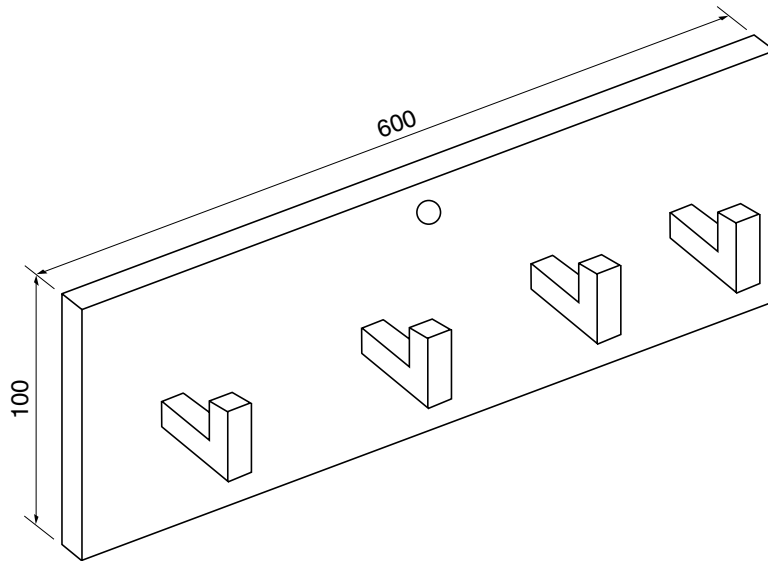
1. .... [1]

2. .... [1]

(b) Aluminium melts at a lower temperature than steel. True or False?

..... [1]

4 Fig. 2 shows a key rack.



**Fig. 2**

(a) Evaluate the rack in terms of its fitness for purpose.

.....

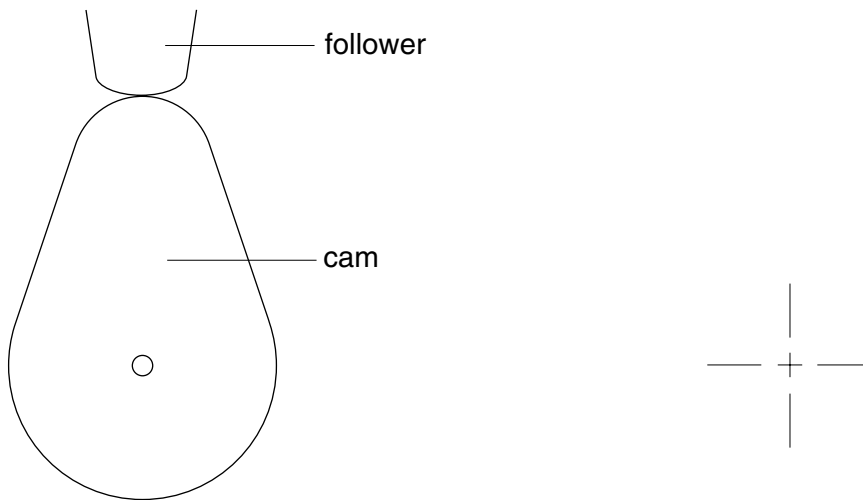
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..... [3]

(b) Suggest **two** ways in which the design could be improved.

1. .... [1]
2. .... [1]

5 Fig. 3 shows a cam and follower.



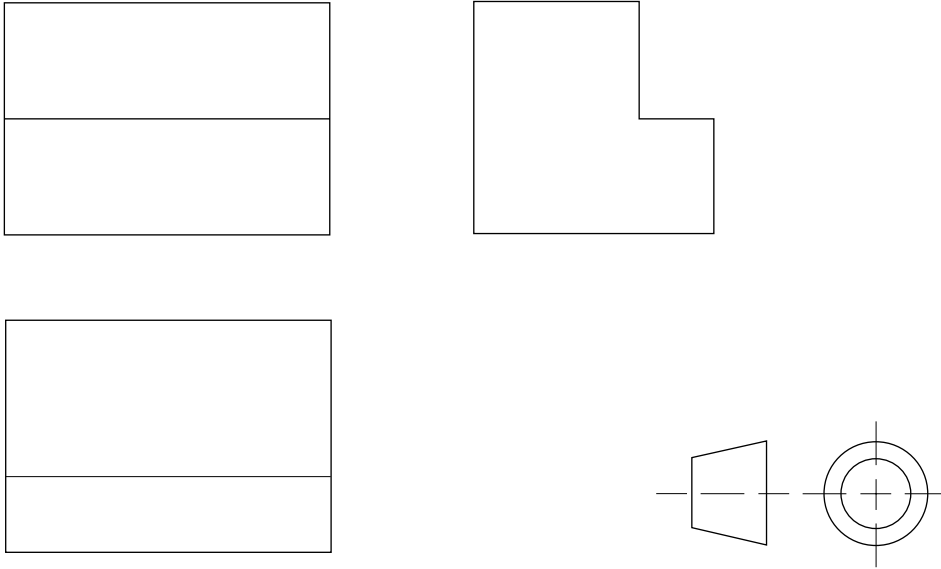
**Fig. 3**

Redraw the cam and follower on the given centre lines to show the follower in its lowest position. [2]

5

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6 Fig. 4 shows three views of a simple block.



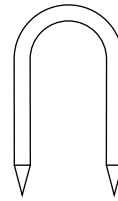
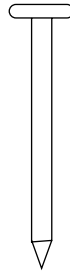
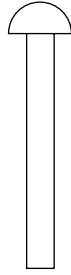
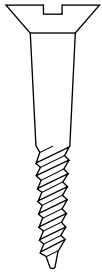
**Fig. 4**

In the space below, sketch the block in two point perspective.

[4]

7 Fig. 5 shows four components used for fixing materials.

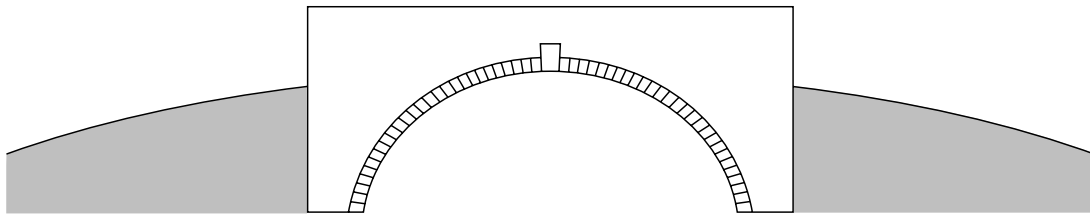
Name each component in the space provided.



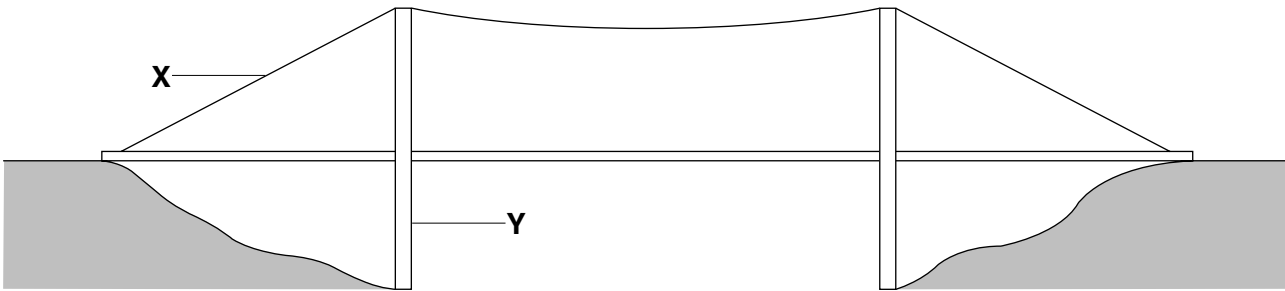
(a) ..... (b) ..... (c) ..... (d) ..... [4]

Fig. 5

8 (a) Name the **two** types of bridge shown in Fig 6.



(i) .....



(ii) ..... [2]

Fig. 6

(b) Name the type of force acting on components **X** and **Y**.

Force X ..... [1]

Force Y ..... [1]

9 Fig. 7 shows a telephone.

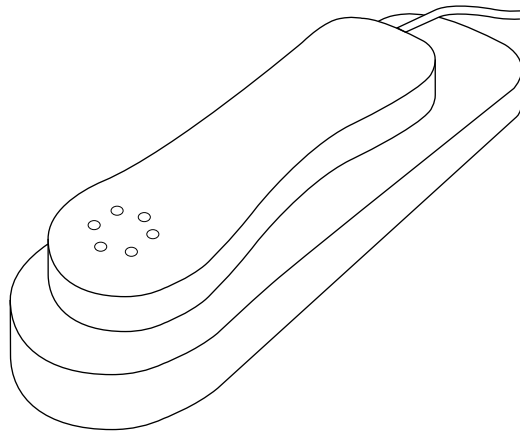


Fig. 7

(a) Identify **two** aspects of the design of a telephone that demand ergonomic consideration.

1. .... [1]

2. .... [1]

(b) Explain how the use of modern plastics has helped to improve the aesthetic aspect of the telephone.

.....

.....

.....

..... [3]

10 Explain the difference between kinetic and potential energy.

.....

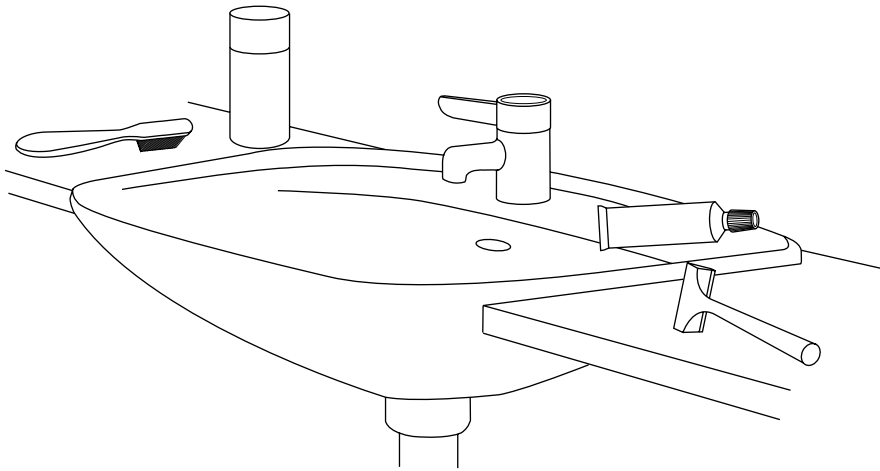
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..... [3]

## Part B

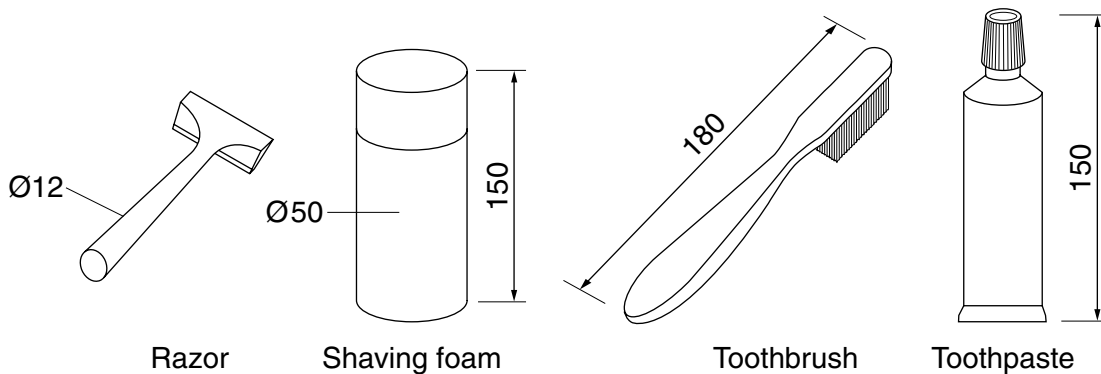
Answer **one** question using the A3 paper provided.

11



There are often many items which are left lying around in the bathroom. Cleaning can be difficult and germs may cause a problem.

The following items need storing ready for daily use.



A one-piece unit is needed to house all of the items shown above.

- (a) List **four** points about the function of such a unit which are important. [4]
- (b) Develop and sketch ideas for the storage unit. [15]
- (c) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (d) Draw, using a method of your own choice, a full solution to your problem. [18]
- (e) Suggest suitable materials for your solution and give reasons for your choice. [5]
- (f) Describe the process to be used in the manufacture of your unit. [5]
- (g) Using simple sketches design **one** other matching item for the bathroom. [5]



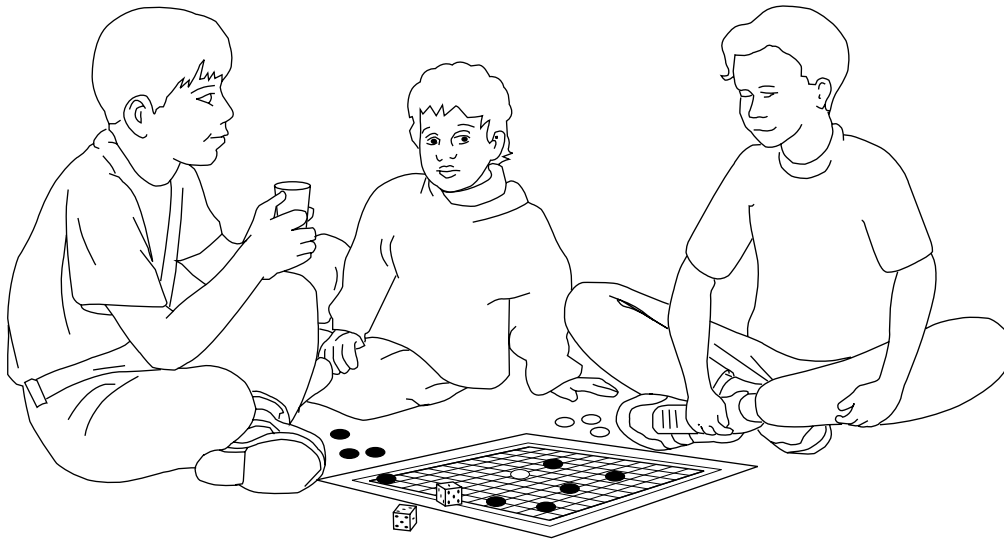


Holding a mirror whilst drying and styling your hair can be difficult.

An adjustable unit to house a mirror would make the task easier.

The mirror is 200 mm 150 mm 3 mm thick.

- (a) List **four** points about the appearance of the mirror unit that you consider to be important. [4]
- (b) List **three** points about the function of the mirror unit that you consider to be important. [3]
- (c) Develop and sketch ideas for the mirror unit. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for the mirror unit and give reasons for your choice. [4]
- (g) Outline the methods used to manufacture **one** part of your mirror unit in a school workshop. [8]



Ecological or 'green issues' are very important to many people, particularly the younger generation. Games are a good way of encouraging young children to learn about such issues whilst still having fun.

Design a board game called ECO-WORLD which would be suitable for children aged 6-7.

- (a) List **three** points about the appearance of such a board game that you consider to be important. [3]
- (b) Develop and sketch ideas for the board game. [15]
- (c) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (d) Draw, using a method of your own choice, a full solution to your problem. [18]
- (e) Explain **two** benefits of using computer aided techniques for designing such a product. [4]
- (f) Using simple sketches, show a design for the development/net of a box to package the game. [8]
- (g) Sketch the letter style to be used on the name ECO-WORLD. [4]



People are being encouraged to cycle to work or school to cut down on the volume of motor traffic. However, cyclists can be at particular risk whilst giving hand signals as they approach busy road junctions, perhaps causing them to wobble into the path of vehicles.

Some form of indicating device would be a good idea.

Your device must:

- allow operation whilst still holding the handlebars with two hands;
- give clear signals;
- not interfere with safe operation of the cycle;
- be lightweight;
- be mechanically or electronically operated.

- (a) List **four** points about the function of such a device that you consider to be important. [4]
- (b) List **three** points about the safety of such a device that you consider to be important. [3]
- (c) Develop and sketch ideas for the device. [15]
- (d) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (e) Draw, using a method of your own choice, a full solution to your problem. [18]
- (f) Suggest suitable materials for your solution and give reasons for your choice. [4]
- (g) Outline the methods used to manufacture **one** part of your device in a school workshop. [8]

