

Candidate Name \_\_\_\_\_

| Centre Number | Candidate Number |
|---------------|------------------|
|               |                  |

**International General Certificate of Secondary Education  
CAMBRIDGE INTERNATIONAL EXAMINATIONS**

**DESIGN AND TECHNOLOGY  
DESIGN AND COMMUNICATION  
PAPER 1 Common Core**

**0445/1  
0446/1**

**OCTOBER/NOVEMBER SESSION 2002**

1 hour 45 minutes

Additional materials:  
A3 Drawing paper  
Standard drawing equipment

**TIME** 1 hour 45 minutes

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

**INSTRUCTIONS TO CANDIDATES**

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

**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 the A3 drawing paper provided.

At the end of the examination, fasten the separate drawing paper securely to the question paper.

**INFORMATION FOR CANDIDATES**

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

You may use a calculator.

| FOR EXAMINER'S USE |  |
|--------------------|--|
| Part A             |  |
| Part B             |  |
| TOTAL              |  |

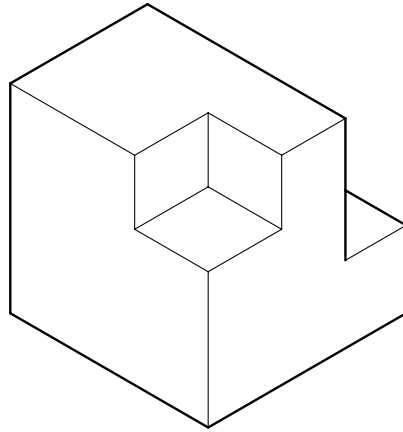
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**This question paper consists of 13 printed pages and 3 blank pages.**

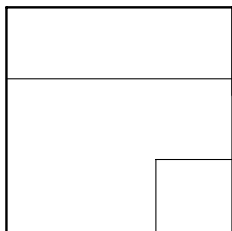
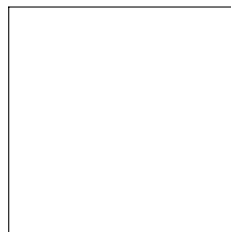
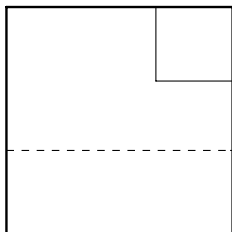
**Part A**

Answer **all** questions.

- 1 Fig. 1 shows an isometric sketch of a wooden block which has two parts cut out. Below are two views of the block in orthographic projection. In the outline provided draw the end view, including hidden detail.



**Fig. 1**



[4]

2 Fig. 2 shows a wheelbarrow.

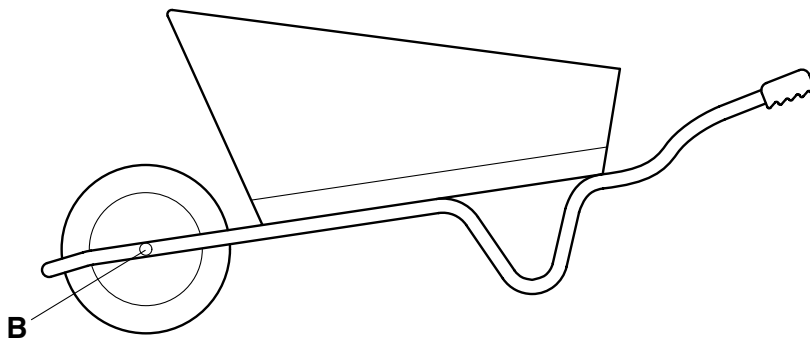


Fig. 2

(a) State the class of lever to which the wheelbarrow belongs.

.....[2]

(b) State the name of the point B.

.....[2]

3 State **one** hazard to the operator when carrying out a vacuum forming process and give a safety precaution to control the risk.

Hazard .....[2]

Safety Precaution .....[2]

4 (a) Trees can be divided into two groups, hardwoods and softwoods. Give **one** example of each.

(i) Hardwood

.....[1]

(ii) Softwood

.....[1]

(b) Name a suitable specific timber that could be used for the following products.

(i) A picnic bench.

.....[1]

(ii) A food chopping board.

.....[1]

5 A company is about to produce a CD rack which will be delivered as a flat-pack ready for self-assembly.

(a) State **two** essential pieces of information the designer would need to find out in order to design the CD rack.

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

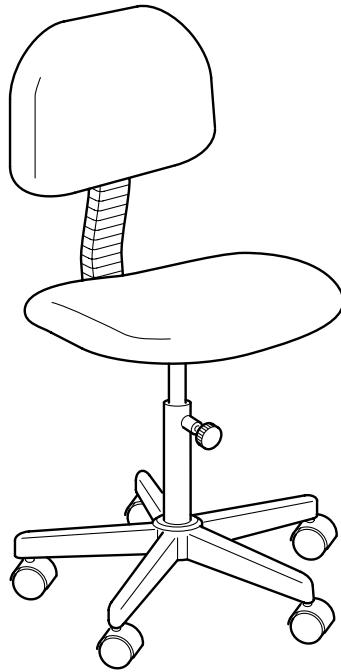
2. ....  
.....[1]

(b) State **one** benefit of a self-assembly flat-pack CD rack for each of the following:

(i) the user.....  
.....[1]

(ii) the manufacturer.....  
.....[1]

6 Fig. 3 shows an adjustable swivel chair that could be used at a desk by a computer operator.



**Fig. 3**

Explain how the use of anthropometric data is essential to the design of the swivel chair.

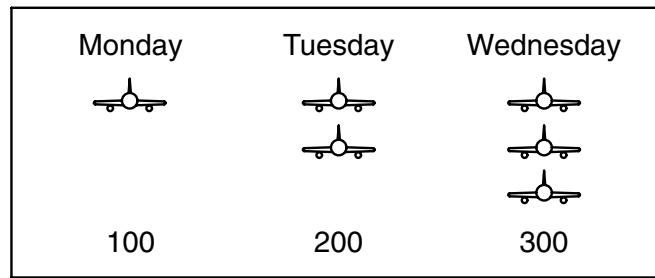
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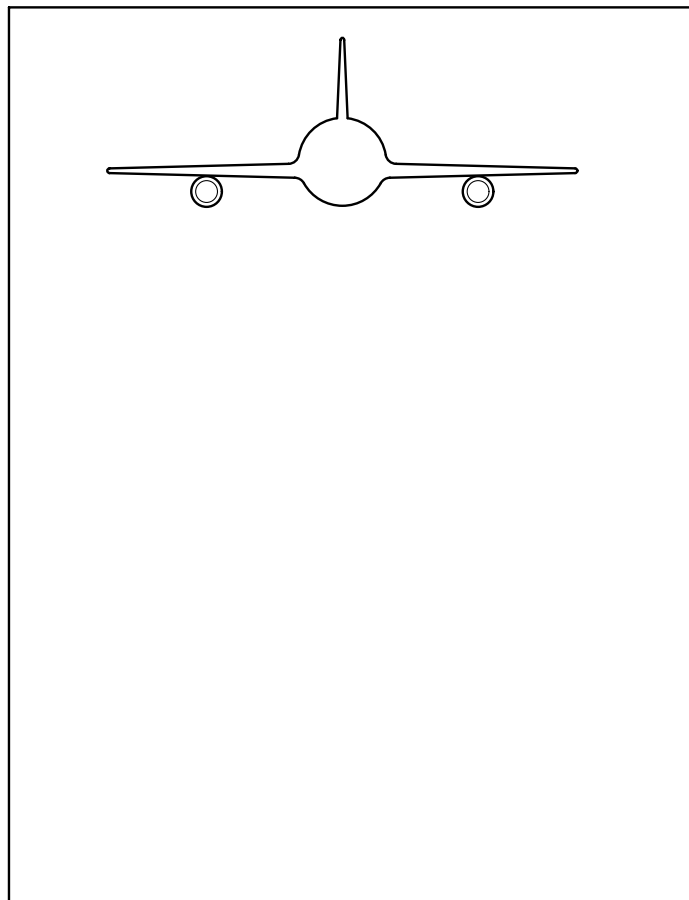
.....[4]

7



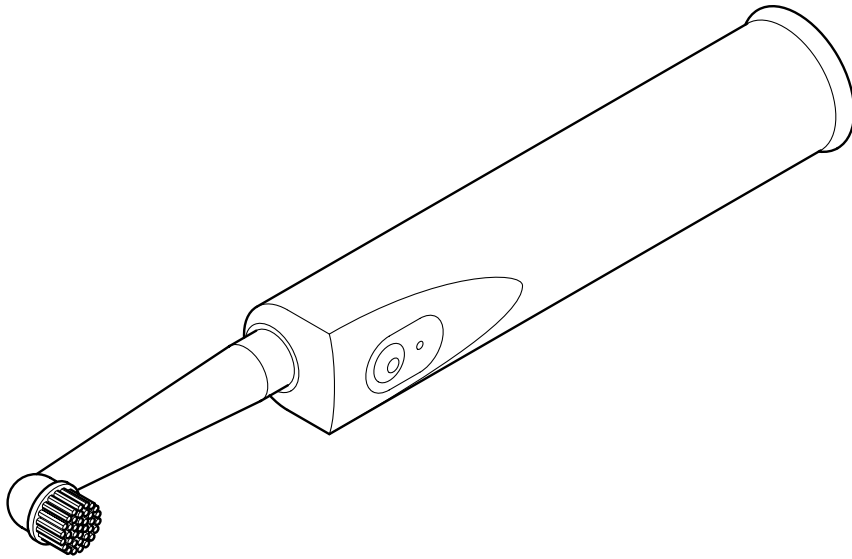
The chart above shows part of the flight departure figures from an international airport. Each symbol on the chart represents 100 flights.

Complete the chart below for Thursday to show departures of 250 flights.



[5]

8 Fig. 4 shows an electric toothbrush.



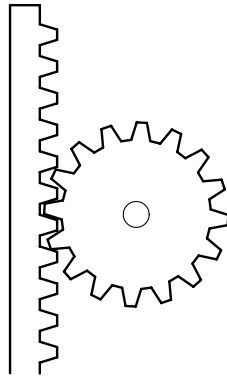
**Fig. 4**

The brush is difficult to hold with wet hands. Describe **two** ways in which the design could be improved to aid grip.

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

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

- 9 The mechanism shown in Fig. 5 is commonly found in machines and works by changing one type of motion into another.



**Fig. 5**

- (a) Name the type of mechanism shown.

.....[1]

- (b) Complete the sentence to describe the change taking place.

'The mechanism in Fig. 5 converts ..... motion into ..... motion.' [2]



10 Fig. 6 shows a small wooden storage box.

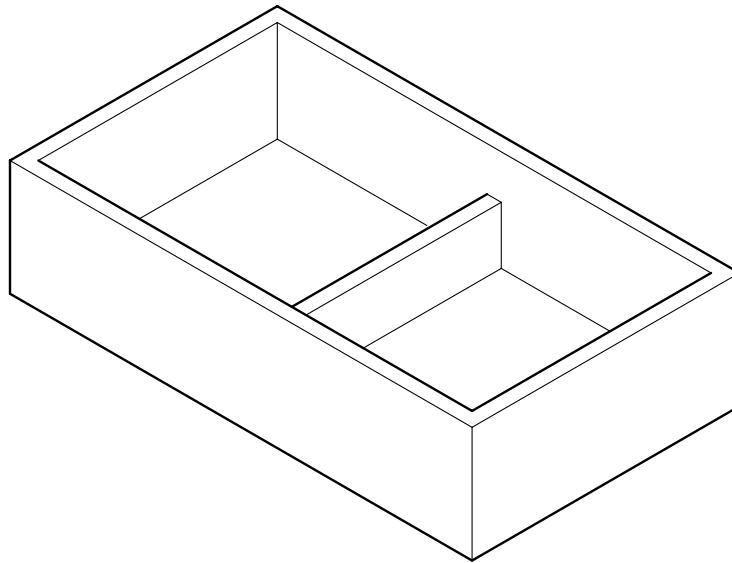


Fig. 6

(a) Name **two** suitable joints for the corners of the box.

1. ....[1]

2. ....[1]

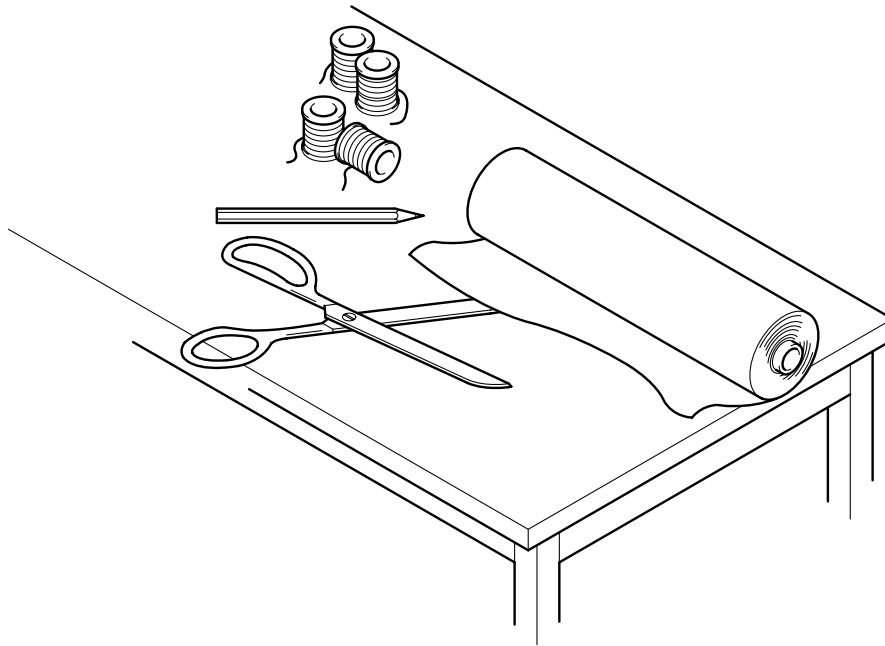
(b) In the space below show how the base could be attached so that it is not visible from the outside of the box.

[2]

## Part B

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

11



The textile department in a school has a large selection of coloured cotton thread held on cotton reels. They are often left on the sewing tables and get tangled, knocked onto the floor or lost.

Some form of storage system to house the cotton reels whilst they are not in use would be a good idea.

It must:

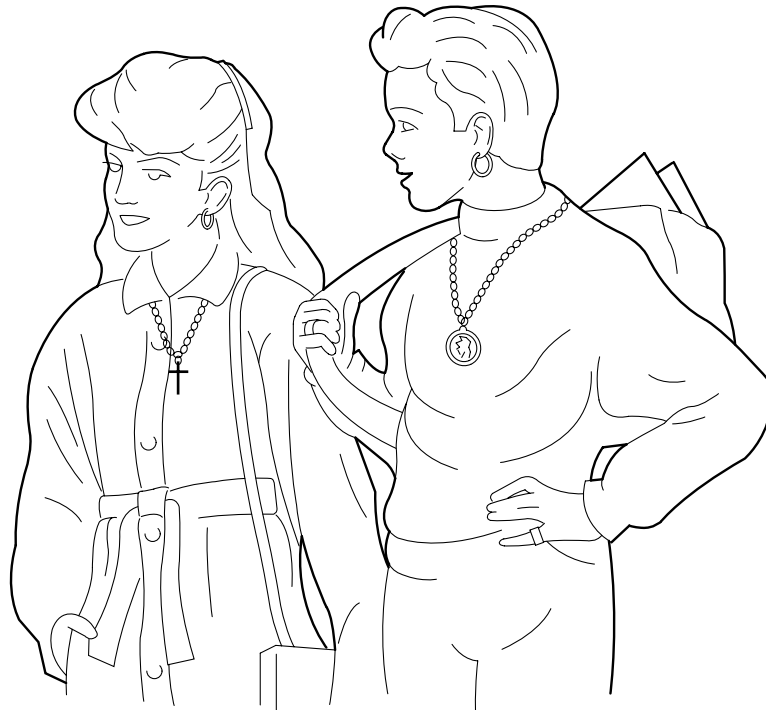
- allow for the reels to be stored in colour order;
- allow for easy removal and replacement of reels;
- be lightweight.

The sizes of the two types of cotton reel and the numbers of coloured reels required are given below.

32.5 mm x 32.5 mm diameter with 8 mm hole. (50 reels in 10 different colours)

25 mm x 15 mm diameter with 10 mm hole. (40 reels in 10 different colours)

- (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 **one** of the processes to be used in the manufacture of your unit. [5]
- (g) Show a simple improvement to your design which will allow for the cotton thread to be measured and cut before dispensing. [5]



You have been asked to design and make a range of inexpensive modern jewellery for sale in the school shop to help raise funds.

The product range may include items for either everyday or party/disco wear.

The theme of the product can be chosen from the following:

- geometric shapes;
- plants;
- shells;
- sport.

- (a) List **four** points about the appearance of the range of jewellery that you consider to be important. [4]
- (b) List **three** other factors which might influence your design. [3]
- (c) Develop and sketch ideas for the jewellery. [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 jewellery and give reasons for your choice. [4]
- (g) Outline the methods used to manufacture **one** of your pieces of jewellery in a school workshop. [8]



Zorro mobile phones are the latest thing in phone technology. Their new design 'Splash' is light, compact (100 mm long, 40 mm wide and 15 mm thick), and also waterproof.

The marketing department would like you to design a counter top display stand in stiff card to present the phone so that it will be noticed by customers.

Your stand must:

- be flat packed for easy posting;
- fit together without glue or tape;
- display the phone;
- use colour to attract attention;
- include both **Zorro** the makers name and **Splash** the product name.

- (a) List **four** points about the appearance of such a display unit that you consider to be important. [4]
- (b) Develop and sketch ideas for the display 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) Explain **two** benefits of using computer aided techniques for designing such a product. [4]
- (f) Draw a simple instruction sheet to show how to assemble the display. [6]
- (g) Show how your design could be developed into a larger floor standing display unit. [5]



Gardens are a place of pleasure and interest for many people. Many gardens have some form of centrepiece to attract attention. A device that utilises the wind to generate movement would be an interesting idea.

- (a) List **four** points about the function of such a device that you consider to be important. [4]
- (b) List **three** important points to consider when designing for exterior use. [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]





