

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

Centre Number

Candidate

Number

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

**DESIGN AND TECHNOLOGY**

PAPER 1 Common Core

**0445/1**

**MAY/JUNE 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	

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



## Part A

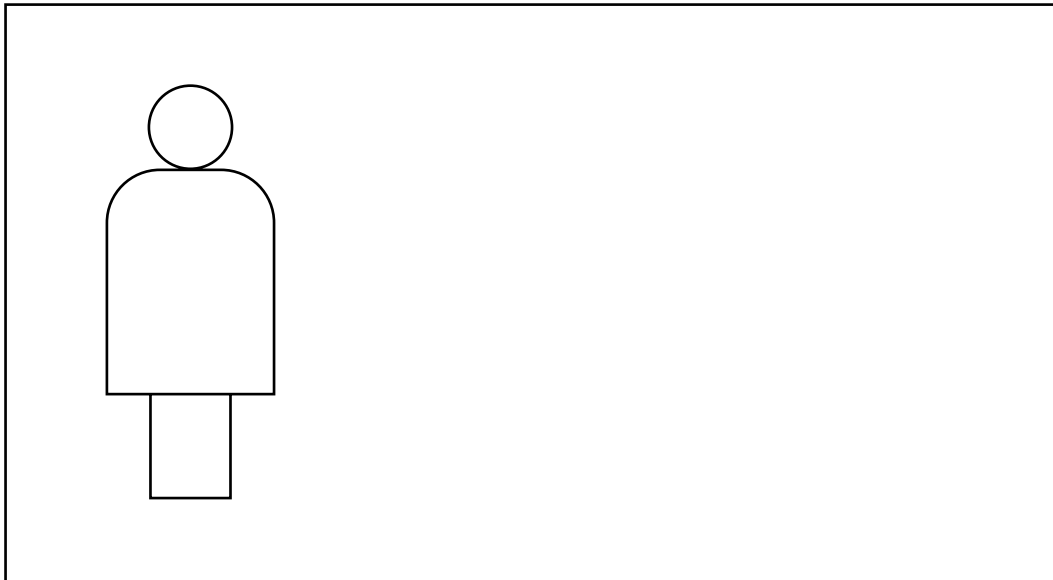
Answer **all** questions.

1

Monday		1000
Tuesday		2000
Wednesday		3000

The table above shows part of the attendance figures at an international exhibition.

Complete the part of the table below to show that Thursday had an attendance of 2500 people. Each symbol on the chart represents 1000 people.



[5]

2 (a) State **one** safety rule which should always be followed when using wood chisels.

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

(b) State **two** safety rules which should always be followed when using a drilling machine.

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

3 Fig. 1 shows a plastic paint tray. It has been made by injection moulding.

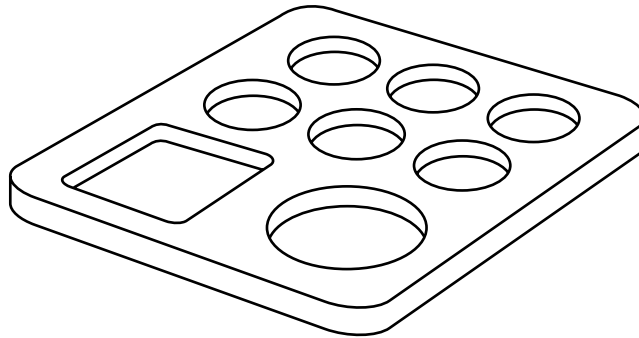


Fig. 1

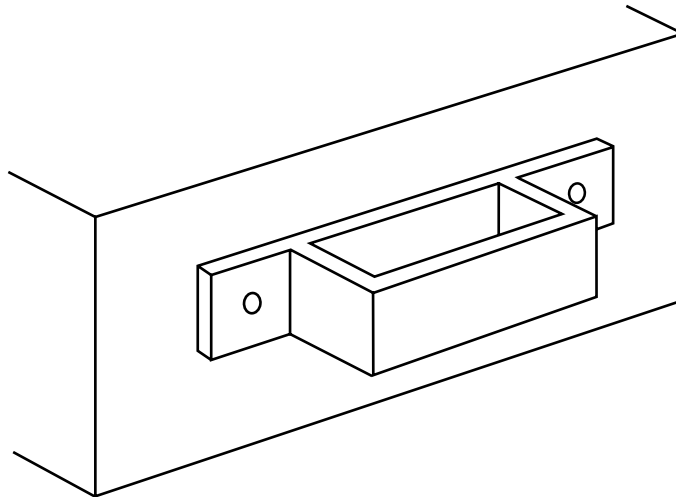
(a) Name a specific plastic for manufacturing the paint tray.

.....[1]

(b) Describe briefly the difference between thermoforming and thermosetting plastics.

.....  
.....  
.....  
.....[3]

4 Fig. 2 shows detail of a handle, made from plastic, to be attached to a desk drawer front.



**Fig. 2**

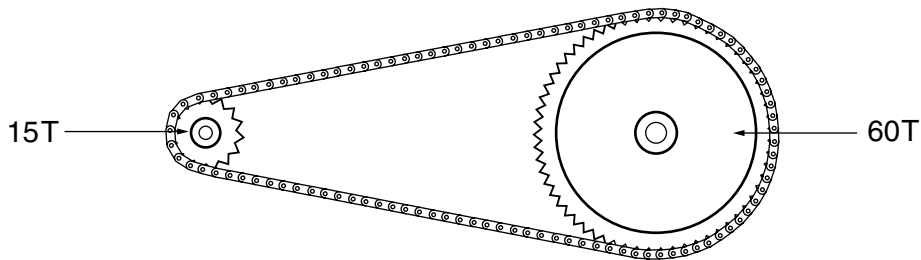
(a) Evaluate the handle in terms of its fitness for purpose.

.....  
 .....  
 .....  
 ..... [3]

(b) Suggest **one** improvement you could make to the handle.

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

5 Fig. 3 shows a sprocket and chain mechanism.



**Fig. 3**

Calculate the velocity ratio for the system, showing all the stages of your calculation.

.....  
 .....  
 .....  
 ..... [3]

- 6 Fig. 4 shows an isometric sketch of a wooden block which has two parts cut out. Below are two complete views of the block in orthographic projection. In the outline provided draw the end view, including hidden detail.

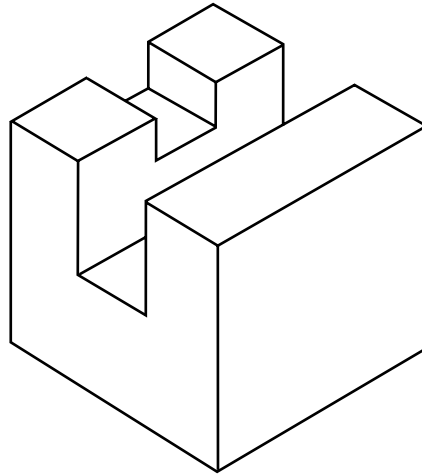
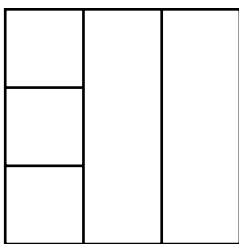
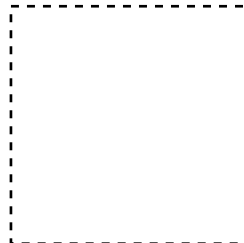
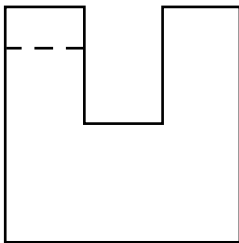


Fig. 4



[4]

7 Quality control is very important when producing more than one of the same product.

(a) Give **one** reason why quality control is important to a manufacturer.

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

(b) Give **one** benefit to the consumer that quality control provides.

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

8 Materials used for the connection of electronic components must be good electrical conductors.

From the list below state **three** materials that are good electrical conductors.

- |                          |       |       |         |
|--------------------------|-------|-------|---------|
| Polystyrene              | Glass | Gold  | Tin     |
| Glass Reinforced Plastic |       | Brass | Ceramic |

1.....[1]  
2.....[1]  
3.....[1]

9 Computer technology can be used during the designing of a product.

(a) State **two** ways in which a computer may be used during the research stage of a project.

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

(b) Explain the meaning of CAD.

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

(c) State **two** advantages of using CAM when making a project.

1 .....[1]

2 .....[1]

10 A manufacturer has decided to produce a new child's toy.

(a) State **two** pieces of information needed before generating possible ideas.

1 .....[1]

2 .....[1]

(b) The prototype of the toy will be tested before it is mass produced. Describe **two** ways in which tests could be carried out.

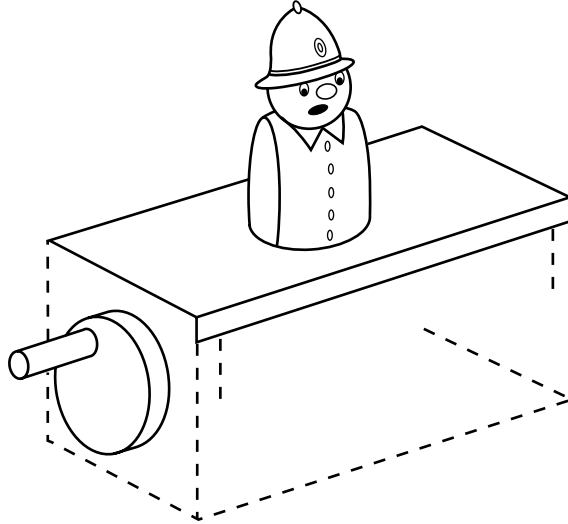
1 .....[1]

2 .....[1]

## Part B

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

- 11 The sketch below shows some parts of a mechanical toy to be made by an eleven year old pupil.



Design a mechanism and case so that when the handle is turned, the policeman will:

- go up and down;
- spin round and round.

- (a) List **four** points about the safety of such a toy that you consider to be important. [4]
- (b) List **four** points about the appearance of such a toy that you consider to be important. [4]
- (c) Develop and sketch ideas for the toy. [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 toy in a school workshop. [7]





Ski Slope, a winter holiday company, are looking for a new image for their catalogue. They want their catalogue to be different from any other holiday companies.

Design an animated or pop-up design to appear in the Ski Slope Winter Catalogue 2002/3.

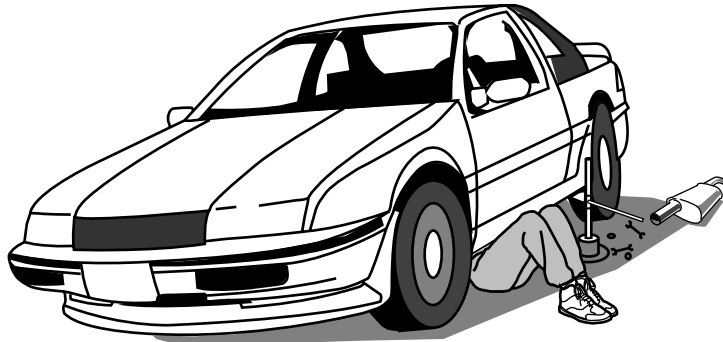
- (a) List **four** points about the appearance of the animated or pop-up design that you consider to be important. [4]
- (b) Develop and sketch ideas for the animated or pop-up design. [15]
- (c) Evaluate your ideas and justify why you have chosen one idea to develop more fully. [8]
- (d) Draw, using 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. [6]
- (f) State **one** method of professionally printing your design. [2]
- (g) A travel shop window display is also needed. Sketch an idea for a 3D display to advertise the company. [7]



Many young children are frightened by the dark and need some form of low-level lighting to reassure them at night.

A lighting unit which would appeal to young children would be a good idea.

- (a) List **four** points about the safety of such a unit that you consider to be important. [4]
- (b) List **four** points about the appearance of such a unit that you consider to be important. [4]
- (c) Develop and sketch ideas for the low-level lighting 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 your solution and give reasons for your choice. [4]
- (g) Design a box in which the low-level lighting unit could be packaged for sale. [7]



Mending a car can be difficult at the best of times. It can be very difficult if the repair is underneath the car with awkward access and the tools required are not easily at hand.

A repair unit that would enable easy access to the underneath of a car would be a good idea.

It must be designed with the following specification points in mind:

- lightweight;
- mobile;
- low to the ground;
- support the weight of an adult;
- have space for tools to be carried.

- (a) List **four** points about the function of such a unit that you consider to be important. [4]
- (b) List **four** points about the safety of such a unit that you consider to be important. [4]
- (c) Develop and sketch ideas for the repair 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 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. [7]

