

Surname		Other Names	
Centre Number		Candidate Number	
Candidate Signature			

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General Certificate of Secondary Education  
Summer 2004

**DESIGN AND TECHNOLOGY:  
GRAPHIC PRODUCTS**

**3543/H**

**H**



**Higher Tier**

Wednesday 16 June 2004 9.00 am to 11.00 am

**In addition to this paper you will require:**

- a pen, pencil, ruler, eraser, pencil sharpener and coloured pencils.
- Marker pens and 45/60 degree set squares may also be used.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
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8			
9			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

Time allowed: 2 hours

**Instructions**

- Use blue or black ink or ball-point pen.
- Fill in the boxes at the top of this page.
- Answer **all** questions in the spaces provided.
- Detach the blue sheet from the back of the examination paper to use in between the sheets to prevent ink bleeding through to the next sheet.
- Do **not** hand in the blue sheet at the end of the examination.

**Information**

- The maximum mark for this paper is 125.
- Mark allocations are shown in brackets.
- Wherever calculations are needed you should show your working.
- All dimensions are given in millimetres unless otherwise stated.
- You are reminded of the need for good English and clear presentation.

**Advice**

Answer the questions in the order given.

Read the following information carefully before you begin the questions which follow.

### CAR CARE PRODUCTS

A national chain of garages, called *AI Cars*, is to give buyers of all its new cars a free complimentary gift. This gift is a high quality, car air freshener in a distinctive box.

A pictorial sketch (**Figure 1**) of the assembled presentation pack is shown without the air freshener in place.

The car air freshener is held in a shaped inner 'tray'. It is inside a top opening presentation box. This is to be decorated and finished to convey quality.

The box is made from good quality board (card) with the plastic inner 'tray' vacuum formed to hold the car air freshener securely.

The board is to be printed with an appropriate graphic detail in colours that suggest a quality product.

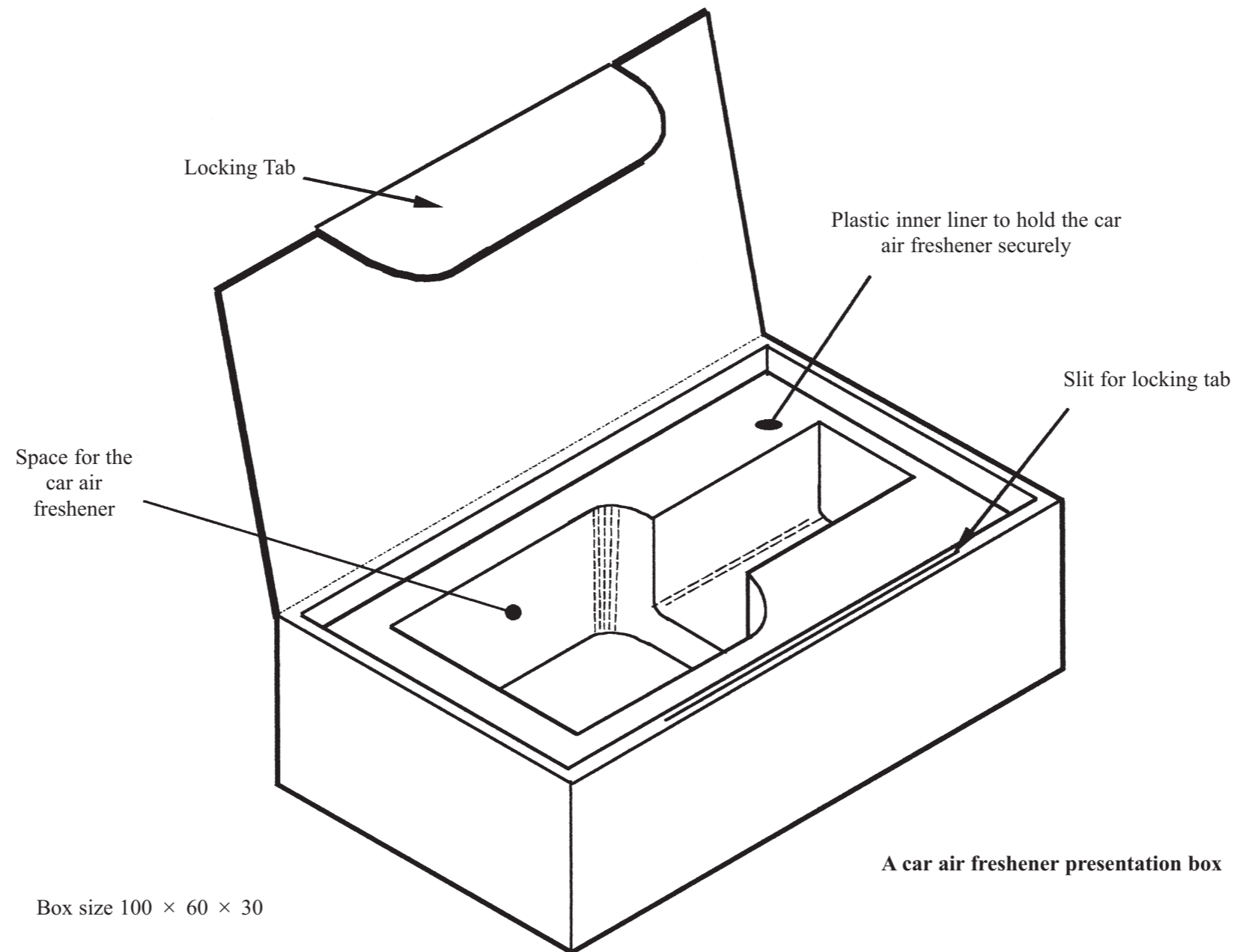


Figure 1

Sheet 1

Turn over ►

Question 1 is about representing data and is worth 6 marks.

Spend about 5 minutes on this question.

- 1 The car air freshener must have a pleasant perfume or fragrance. A survey was carried out to find out which fragrances were most popular. The results are given below.

Results of survey	
<i>Fragrance</i>	<i>Percentage</i>
Fresh Flowers	25%
Sea Spray	15%
Mountain Breeze	40%
Summer Fruits	20%

Complete the bar chart (**Figure 2**) to represent the results of the survey and colour the sections. One bar has been completed.

Marks will be awarded for:

- (a) accuracy; (3 marks)
- (b) quality of colour; (2 marks)
- (c) labelling. (1 mark)

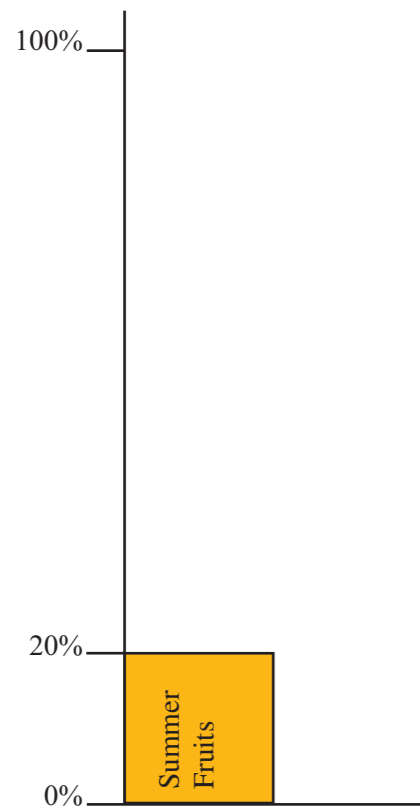


Figure 2

6

Question 2 is about manufacturing and is worth 6 marks.

Spend about 5 minutes on this question.

- 2 The gift box has to hold the car air freshener safely and securely.

A thin liner is made by the process of vacuum forming.

- (a) Name a thermoplastic material used in the process of vacuum forming.

.....  
(1 mark)

- (b) Describe with sketches and notes the process of vacuum forming. (5 marks)

6

Question 3 is about designing and is worth 15 marks.

Spend about 15 minutes on this question.

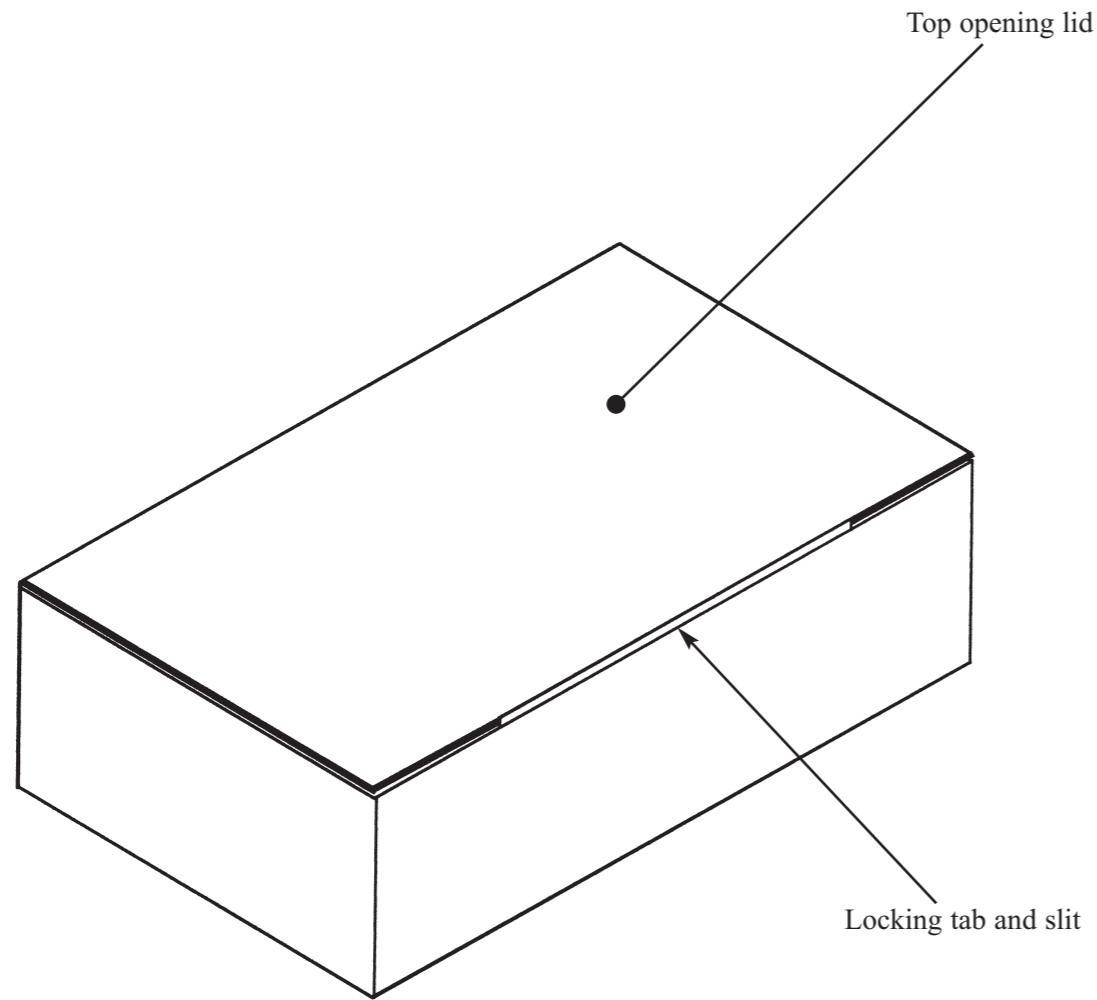


Figure 3

3 As a graphics designer you are to design the graphic details for the lid and sides of the presentation box (Figure 3).

*AICars* have produced the following specification for the box to help you.

The **box lid** and **sides** will:

- have **graphic detail** which suggests **mountains**;
- use **colours** which convey a quality product;
- have a company **logo** based on the letters **A1C** standing for *A1 Cars* and must be clearly visible on the lid;
- include a **print finishing effect** to enhance its appearance.

On the next sheet, sketch a variety of images and ideas that meet this specification.

ANSWER QUESTION 3 ON THE NEXT SHEET

DO NOT ANSWER ON THIS SHEET

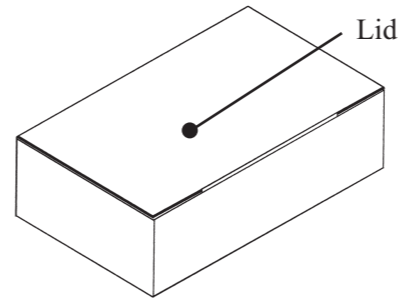
Question 3 continues on Sheet 4

**Question 3, continued**

Use the specification given on Sheet 3 for the **lid** and **sides** of the presentation box.

In the space below:

- develop **three** suitable ideas for the box's **graphic detail**, which suggests **mountains**; (6 marks)
- indicate **colour**; (1 mark)
- develop **one logo** in a variety of styles based on the letters **A1C**; (3 marks)
- indicate an appropriate **print finishing effect**; (2 marks)
- **evaluate** your ideas. (3 marks)



**Figure 4**

.....

.....

Question 4 is about presentation and consumer information and is worth 29 marks.

Spend about 25 minutes on this question.

4 (a) Complete the graphic detail for your selected design on **Figure 5**. Include the lid and sides in your final presentation drawing.

This question is worth 20 marks.

Marks will be awarded for:

- (i) full use of specification; (4 marks)
- (ii) quality of drawing; (3 marks)
- (iii) ideas applied from Question 3; (3 marks)
- (iv) design layout; (5 marks)
- (v) quality of colouring. (5 marks)

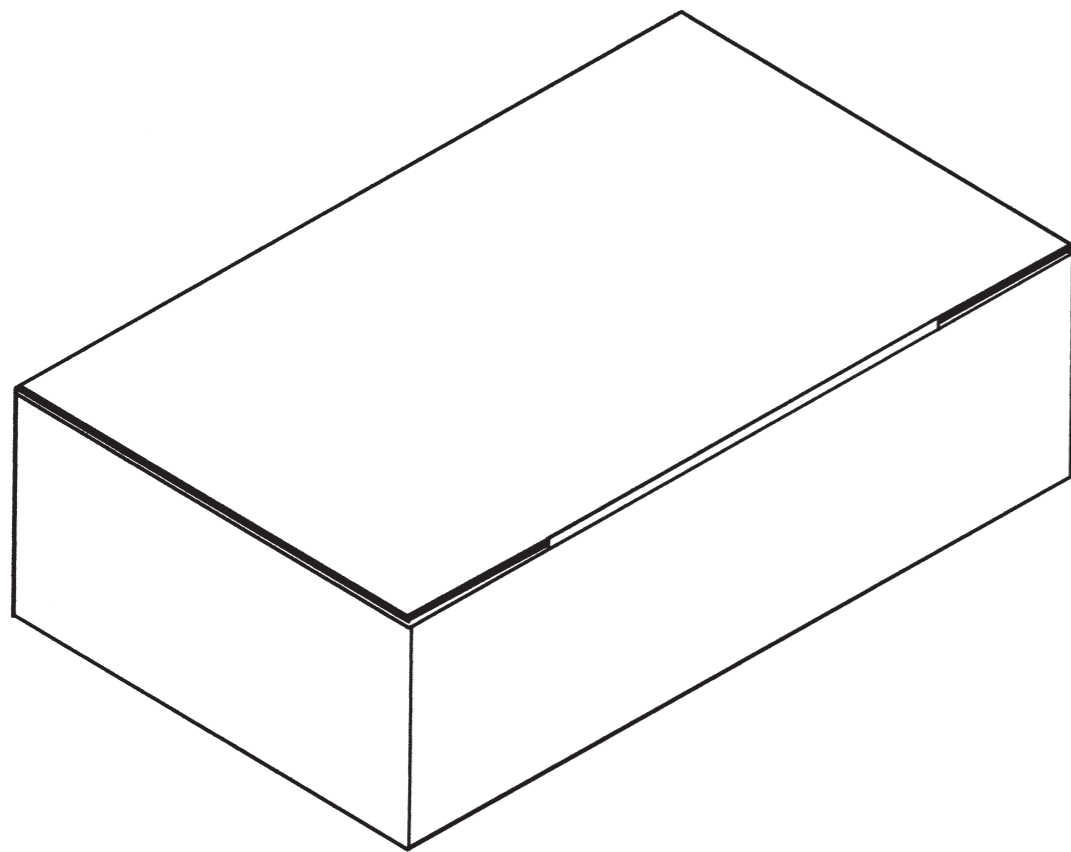


Figure 5

(b) Many packages have bar codes, similar to the one shown, printed on them.



Name and explain **two** items of information contained in a bar code.

(i) Name ..... (1 mark)

Explanation .....  
.....  
..... (2 marks)

(ii) Name ..... (1 mark)

Explanation .....  
.....  
..... (2 marks)

(c) (i) Name the type of pictorial drawing used in part (a).  
..... (1 mark)

(ii) Name another type of pictorial drawing.  
..... (2 marks)

Question 5 is about locking mechanisms and is worth 5 marks.

Spend about 5 minutes on this question.

- 5 During the evaluation of a prototype box it was found that the locking tab of the lid easily slipped out of its slit in the front panel.

Below is an incomplete sketch of the box (Figure 6) with the inner tray removed.

Draw an improved locking mechanism on the sketch so that the lid is held more securely. (5 marks)

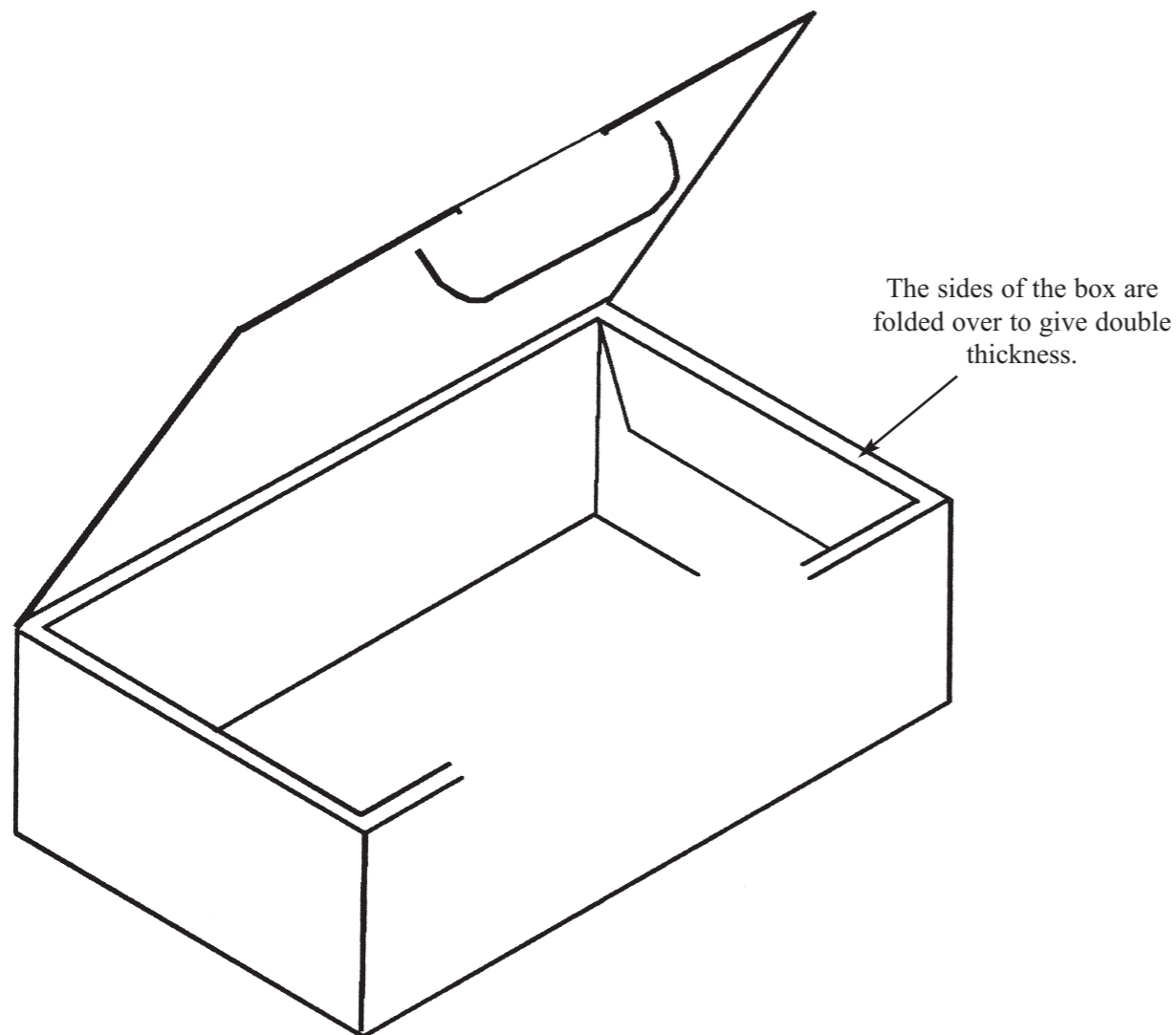


Figure 6

5

Sheet 6

Question 6 is about enlargements and British Standards and is worth 8 marks.

Spend about 10 minutes on this question.

- 6 A novelty car air freshener, in the shape of a foot (Figure 7) is made from a scented plastic material.

The outline of the foot must be enlarged before final production starts.

- (a) Use the given grid, enlarge the **outline** of the foot. (Do not colour). (3 marks)

- (b) Using British Standard conventions, add to the enlargement:

- the overall width, and;
- the overall height;
- give the scale used.

(5 marks)

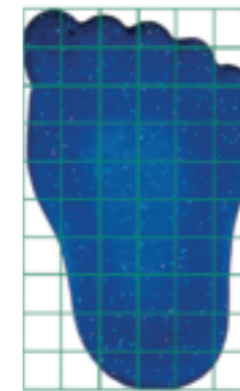
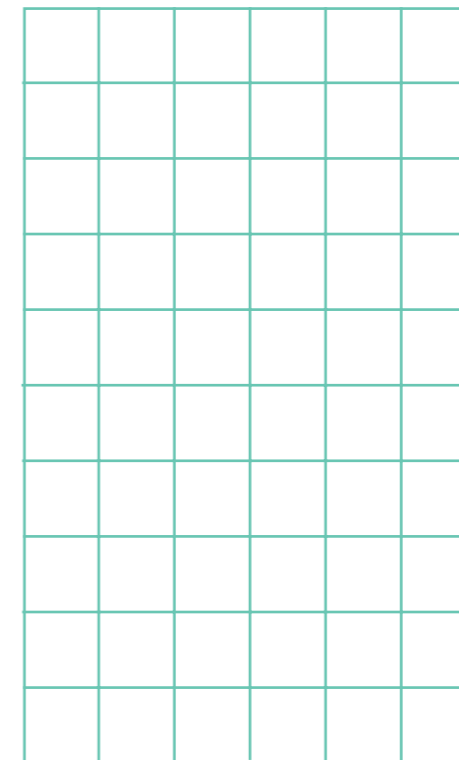


Figure 7



Scale \_\_\_\_\_ : \_\_\_\_\_

DO NOT COLOUR

8

Turn over ►

Question 7 is about materials and is worth 17 marks.






Spend about 20 minutes on this question.

- 7 (a) The air freshener (**Figure 8**) is in a 'blister' pack. It can be made by hand and rendered in school using the equipment shown below.

Complete the chart by:

- (i) naming each item of equipment shown;
- (ii) explaining its use in the making of the backing card.

*One example has been completed for you.*

Equipment	Name	Use on the backing card
	<i>Air brush</i>	<i>To add background colour to the card.</i>
	.....	.....
	.....	.....
	.....	.....
	.....	.....

(8 marks)



Figure 8

- (b) Materials have properties which make them suitable for different uses.

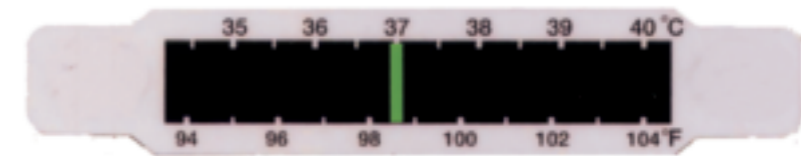
Study the list of materials below and give a different reason why each is suitable for the given use.

*One example has been completed for you.*

Materials	Typical Use	Reason
Vegetable Protein Board	Fast food box	<i>Made from vegetable material and is biodegradable</i>
Polystyrene sheet	'Blister' packs	
Foam core board	Architectural models	
Acrylic sheet	Shop signs	
Corrugated Board	Packaging	
Block Foam	Model buildings	

(5 marks)

- (c) Smart materials have replaced more traditional materials. The forehead thermometer (**Figure 9**) is an alternative to a glass thermometer.



Reproduced by kind permission of The Boots Company PLC

Figure 9

Explain how a smart material is used in this type of thermometer.

.....

.....

.....

.....

.....

.....

.....

(4 marks)



Question 8 is about Computer Aided Designing and Manufacturing and is worth 13 marks.

Spend about 15 minutes on this question.

8 The car air freshener shown (Figure 10) has a distinctive shaped backing card. It is important that all backing cards made are the same shape and size.

Three identical backing cards are to be cut from every A4 sheet of printed card.

(a) Figure 11 shows the major CAD/CAM stages, in random order, involved in producing a batch of 30 identical backing cards.

(i) Re-arrange the given stages by writing the stage number or letter in the appropriate cell of the incomplete flow-chart (Figure 12). (7 marks)

(ii) Add two feedback loops for quality control. (2 marks)

	STAGE	DESCRIPTION
CAD	A	Load program
	B	Copy and paste card outline twice
	C	Draw one backing card outline
	D	Is the design and layout OK?

CAM	1	STOP
	2	Send design to cutter
	3	Have 30 cards been cut?
	4	Cut out the backing card

Figure 11

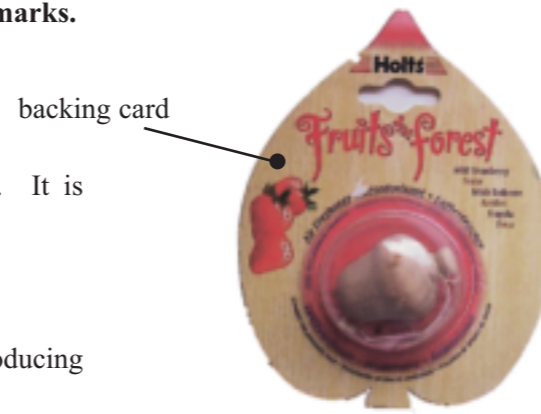


Figure 10

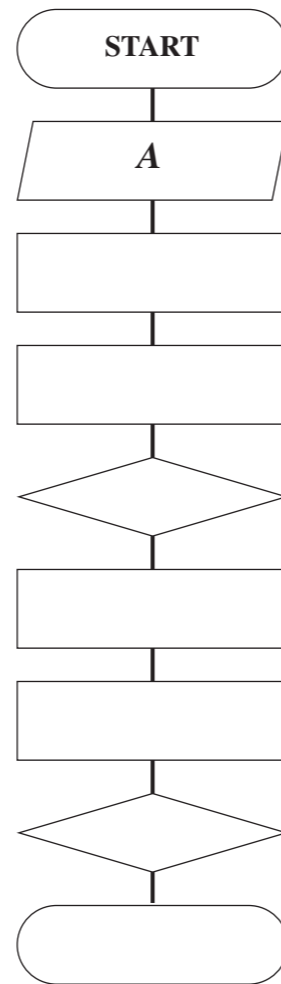


Figure 12

(b) (i) Explain one advantage of using CAD/CAM in batch production.

.....  
 .....  
 .....  
 (2 marks)

(ii) Explain one disadvantage of using CAD/CAM in batch production.

.....  
 .....  
 .....  
 (2 marks)

Question 9 is about environmental and social issues and is worth 26 marks.

Spend about 20 minutes on this question.

9 Figure 13 shows three different car air fresheners inside their packaging.



Figure 13

(a) Give **two** reasons why air fresheners are contained inside sealed packages.

Reason 1 .....

.....

Reason 2 .....

.....

(4 marks)

(b) (i) Are the transparent parts of the packages in **Figure 13** made from renewable or non-renewable material?

Explain your answer.

They are made from ..... materials

because .....

.....

(2 marks)

(ii) After opening, the packages in **Figure 13** are thrown away.

Explain the long term effect on the environment of the following materials if they are not correctly disposed of.

the backing card: .....

.....

.....

(3 marks)

the transparent materials: .....

.....

.....

(3 marks)

(c) In the box below draw and colour a symbol which shows that a package contains 50% recycled material.



(5 marks)

(d) Give **one** reasoned advantage and **one** reasoned disadvantage of using recycled paper and board.

(i) Advantage: .....

Reason: .....

.....

(2 marks)

(ii) Disadvantage: .....

Reason: .....

.....

(2 marks)

(e) (i) Explain why recycled card should *not* be used for food packaging.

.....

.....

.....

(2 marks)

(ii) Explain **one** unwanted effect on the local environment that is near to a “fast food” shop.

.....

.....

(2 marks)

(iii) How can a graphic designer of fast-food packaging encourage people to care for their local environment?

.....

(1 mark)

**END OF QUESTIONS**

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