

Surname					Other Names				
Centre Number					Candidate Number				
Candidate Signature									

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General Certificate of Secondary Education  
Summer 2003

**DESIGN AND TECHNOLOGY  
GRAPHIC PRODUCTS**

**3543/H**

**H**



**HIGHER TIER**

Thursday 12 June 2003 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.

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.

For Examiner's Use			
Number	Mark	Number	Mark
1			
2			
3			
4			
5			
6			
7			
8			
Total (Column 1)	→		
Total (Column 2)	→		
TOTAL			
Examiner's Initials			

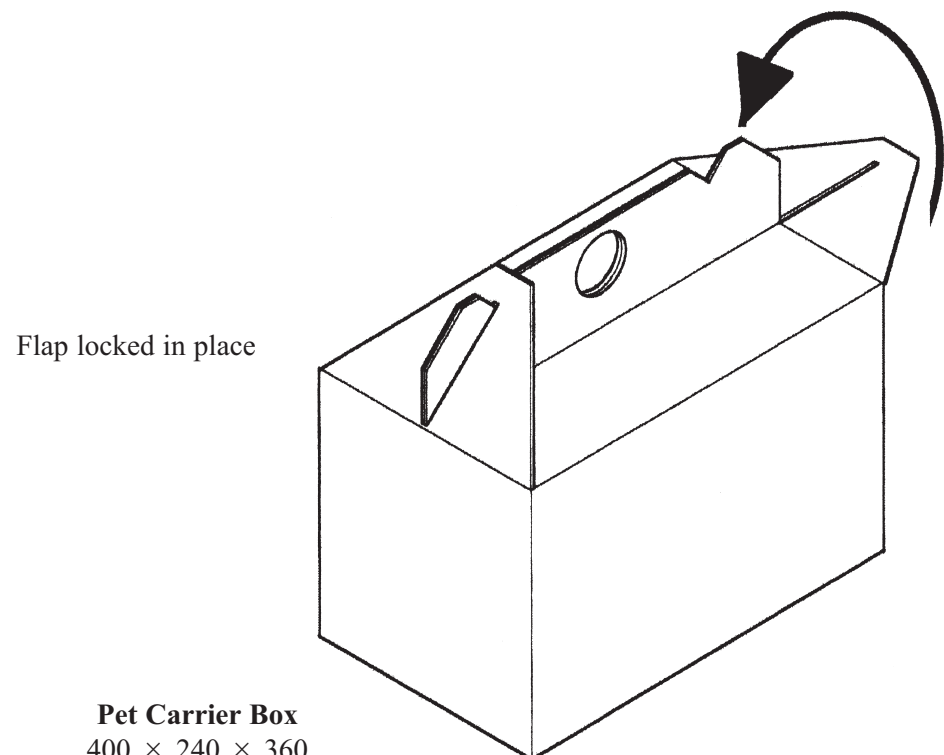
Read the following information carefully before you begin the questions which follow.

### SMALL PET ANIMAL CARRIER BOXES

A voluntary charity looks after lost and injured small mammals in an animal shelter. The shelter is called "PETZONE".

The charity's volunteers want to raise funds by selling a range of suitable products. One of the proposed products is a box in which small animals and birds can be carried. Customers will buy and assemble the carrier box and use it to transport an animal safely.

The carrier box will be made of corrugated sheet material and printed with suitable decoration and relevant information. The basic shape of the carrier box is shown below.



End flaps lock onto centre pieces to secure the lid

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

Spend about 5 minutes on this question.

1 A group of school children were asked about their pets, the results are shown below.

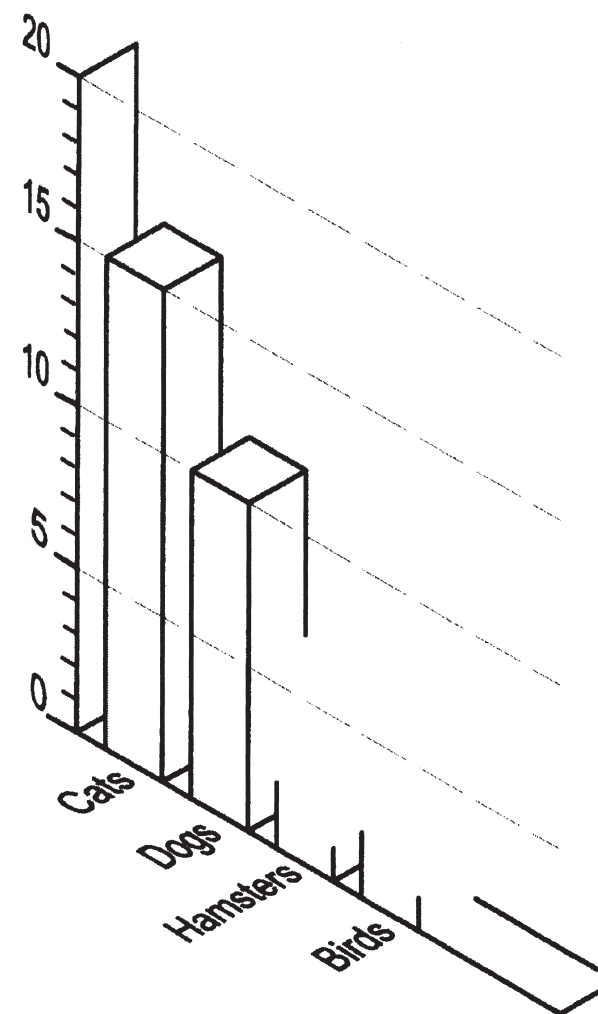
- 15 children had cats
- 10 children had dogs
- 6 children had hamsters
- 4 children had birds

An unfinished 3-dimensional bar chart of the results of the survey is shown below.

- (i) Complete the bar chart.
- (ii) Colour the bar chart to show its 3-D effect.

(3 marks)

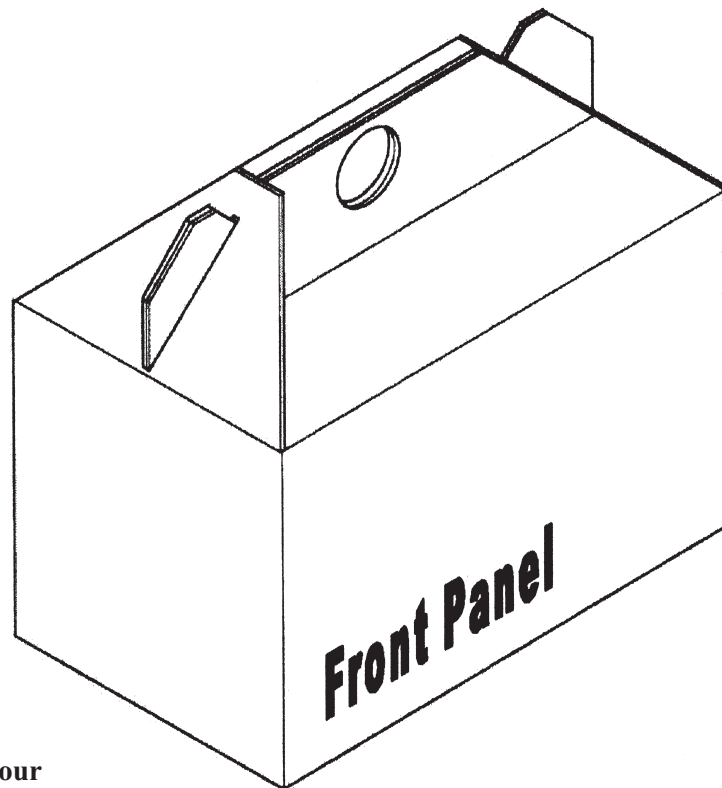
(3 marks)



Question 2 is about designing and is worth 20 marks.

Spend about 20 minutes on this question.

The pictorial drawing below shows the pet carrier box with the lid locked in the closed position. The front panel is to be printed with suitable decoration and relevant information.



Do not put your designs on this diagram.

- 2 You are asked to make the pet carrier box more appealing to customers by adding a design to the front panel using black and one other colour on the *white-faced* sheet material.

You must follow the specification given below:

- the charity's name "PETZONE" in a suitable *letter style (font)* must be clearly visible;
- a *logo* that shows the charity's connection with animals must be included;
- appropriate *ventilation* openings must be shown;
- use only *black and one other colour* on a white background.

On Sheet 3 sketch a variety of images and ideas suitable for the front panel that meet this specification.

Evaluate each specification point.

Marks will be awarded for:

- |  |           |
|--|-----------|
| (a) a variety of images;                 | (7 marks) |
| (b) quality of sketching;                | (5 marks) |
| (c) indication of colour;                | (2 marks) |
| (d) clear, reasoned evaluation of ideas. | (6 marks) |

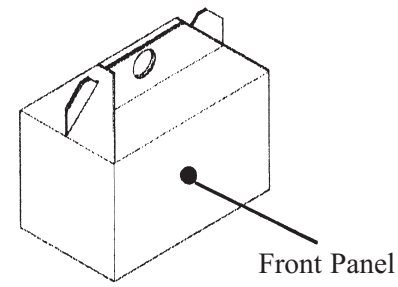
**ANSWER QUESTION 2 ON THE NEXT SHEET**

Question 2 continues on Sheet 3

**Question 2, continued**

Using the specification, in the space below:

- (a) develop ideas for a *letter style (font)* for the charity's name "PETZONE";
- (b) develop a *logo* suitable for an animal charity;
- (c) develop appropriate *ventilation* openings;
- (d) give clear, reasoned *evaluations* of your ideas.



Specification:

- "PETZONE" in a suitable *letter style (font)*;
- a *logo* that shows the charity's connection with animals;
- appropriate *ventilation* openings must be shown;
- use only *black and one other colour* on a white background.

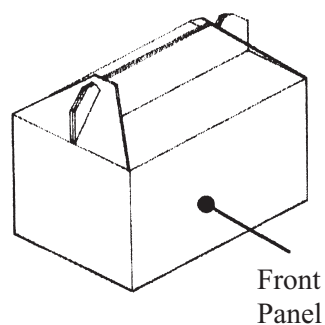
Question 3 is about presentation and is worth 16 marks.

Spend about 15 minutes on this question.

The front panel of the pet carrier box is shown.

- 3 Combine your best ideas from Question 2 and produce a colour presentation drawing on the front panel of the pet carrier box using the given specification.

(16 marks)



Marks will be awarded for:

- (i) use of the specification – *PETZONE*, letter style (font)
  - logo for the animal charity
  - ventilation openings
  - one colour plus black;

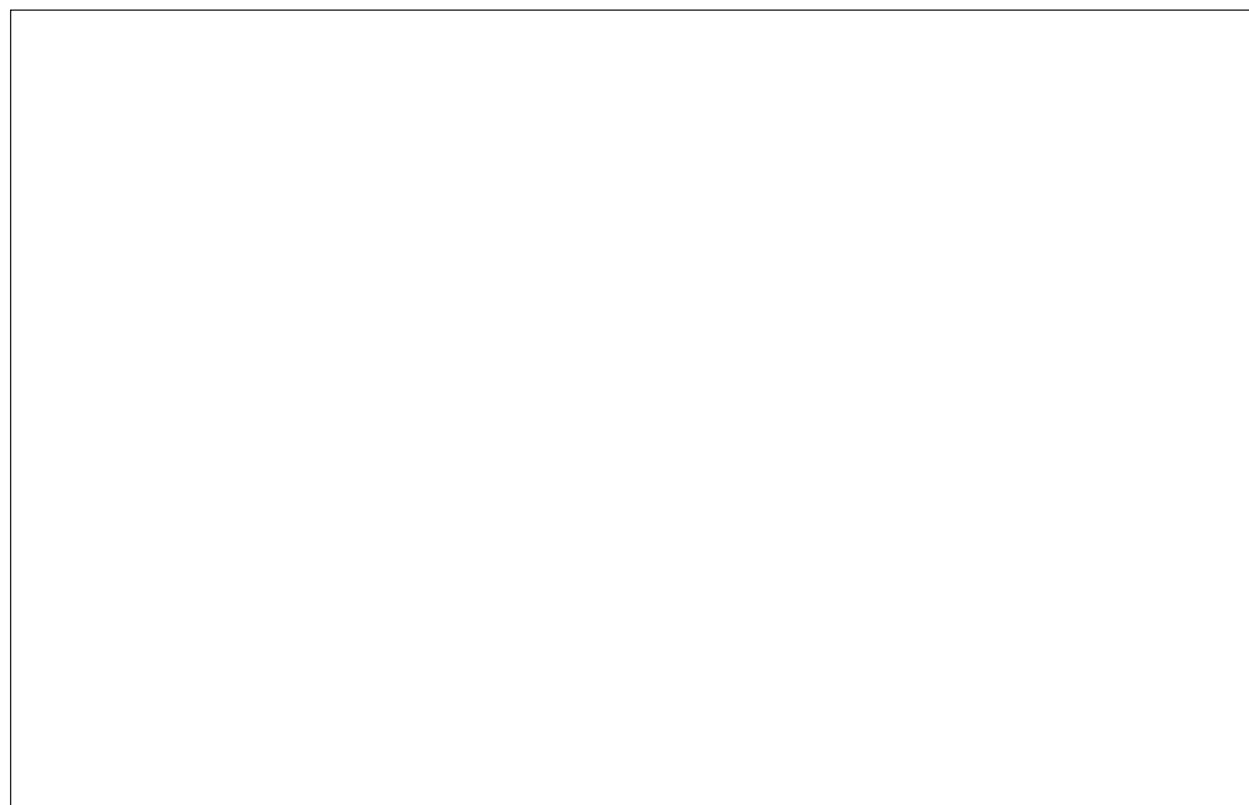
(4 marks)

- (ii) quality of drawings;
- (iii) suitable layout;
- (iv) quality of colouring.

(5 marks)

(4 marks)

(3 marks)



Front panel

Question 4 is about evaluation and modifying a design and is worth 10 marks.

Spend about 10 minutes on this question.

When the pet carrier box opposite was tested the handle was found weak and uncomfortable.

4 (a) In the area below develop a design for an improved cut out handle.

Use notes to explain your ideas.

(6 marks)

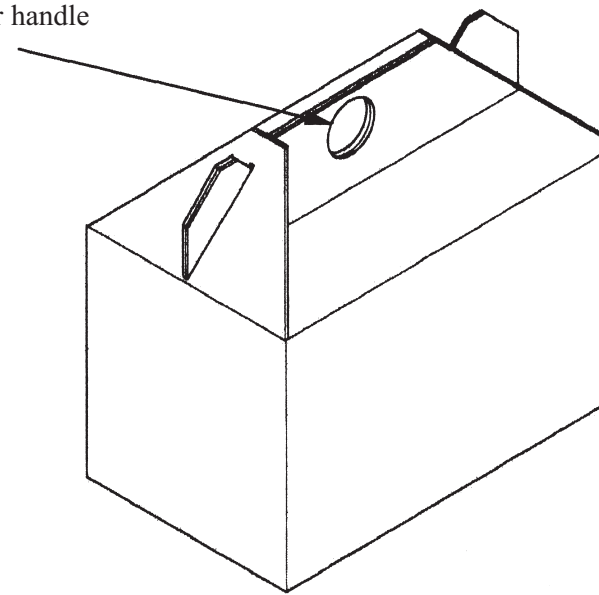
(b) Draw your modified handle design on the detail grid below.

(3 marks)

(c) Give the scale used on your final design in the given box on the detail grid below.

(1 mark)

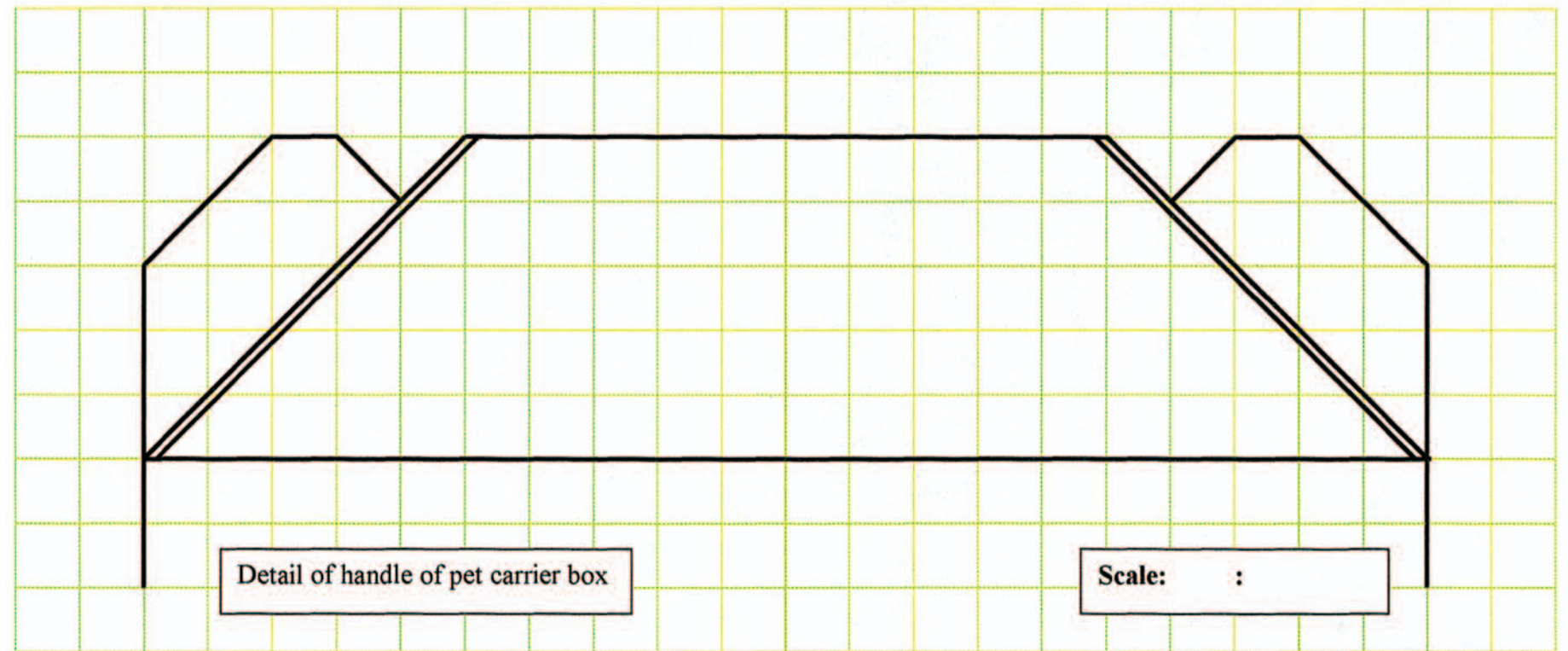
Cut out circular handle



Outline sketch of the pet carrier box.

Length 400  
Width 240  
Height 360

Develop your ideas for an improved handle here.



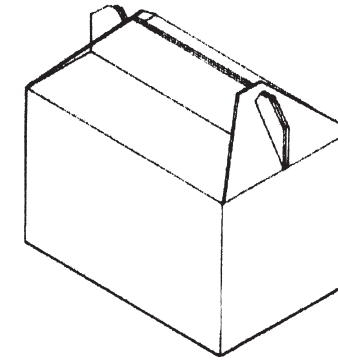


Question 5 is about Third Angle Orthographic projection and British Standards and is worth 21 marks.

Spend about 20 minutes on this question.

A pictorial sketch of the pet carrier box.

Length 400  
Width 240  
Height 360



5 The grid shows an incomplete third angle orthographic projection drawing of the pet carrier box.

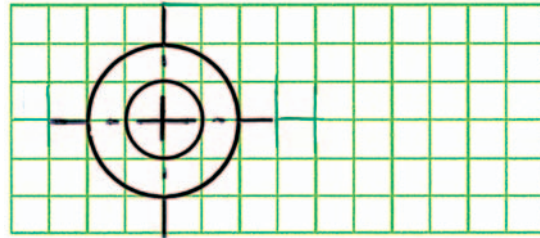
(a) Complete the plan by adding the missing lines.

(10 marks)

**DO NOT INCLUDE HIDDEN DETAIL**

(b) Using British Standards conventions:

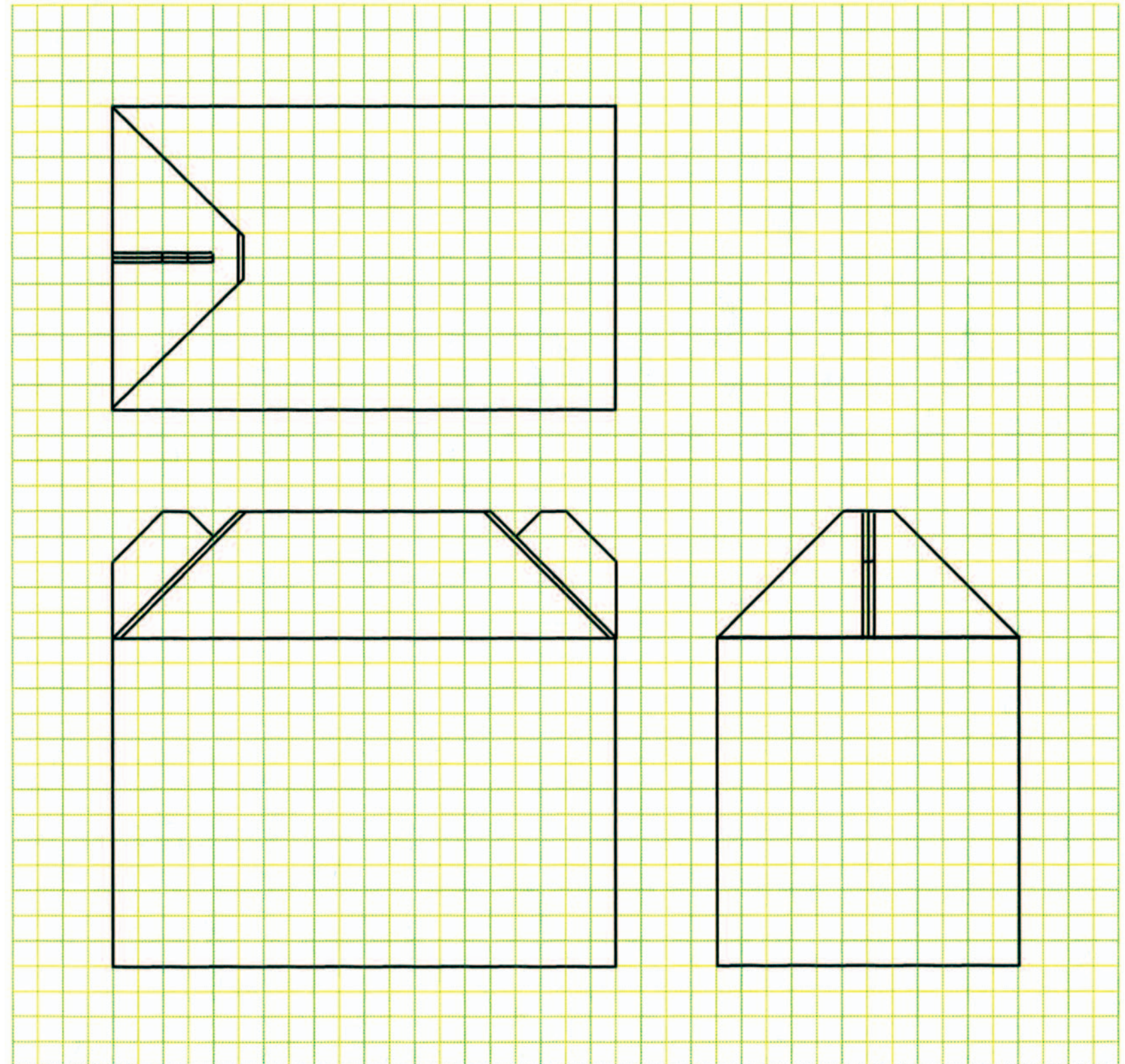
(i) In the space below complete the symbol for 3rd Angle Orthographic Projection. (2 marks)



(ii) Add the following sizes to the drawing:

- the length of the carrier box;
- the overall height of the carrier box;
- the width of the carrier box.

(9 marks)



Question 6 is about materials and is worth 20 marks.

Spend about 20 minutes on this question.

6 The pet carrier boxes are often made from corrugated cardboard.

(a) Use pictorial freehand sketches and notes, show the construction of corrugated cardboard.

(3 marks)

(b) Give **two** advantages with reasons, why corrugated card is used for pet carrier boxes.

Advantage 1 .....

Reason .....

(2 marks)

Advantage 2 .....

Reason .....

(2 marks)

(c) Give **one** disadvantage, with a reason, of using corrugated card for pet carrier boxes.

Disadvantage .....

Reason .....

(2 marks)

(c) The corrugated cardboard pet carrier box is held together along a vertical seam by an “adhesive free” method.

Using pictorial freehand sketches and notes show an “adhesive free” method of constructing a vertical seam.

Marks will be awarded as follows:

(i) sketches;

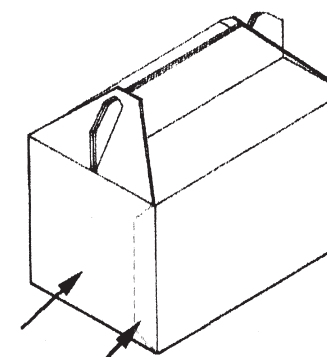
(3 marks)

(ii) notes.

(2 marks)

End panel

Tab on the inside of the box



(d) A label on some products has the message “PETS ARE FOR LIFE”. The ink used is a “smart material”.

(i) Explain the term “smart material”.

.....  
.....

(3 marks)

(ii) Explain how a thermochromatic ink reacts.

.....  
.....

(2 marks)

(iii) Give **one** other example of the use of thermochromatic inks.

.....  
.....

(1 mark)

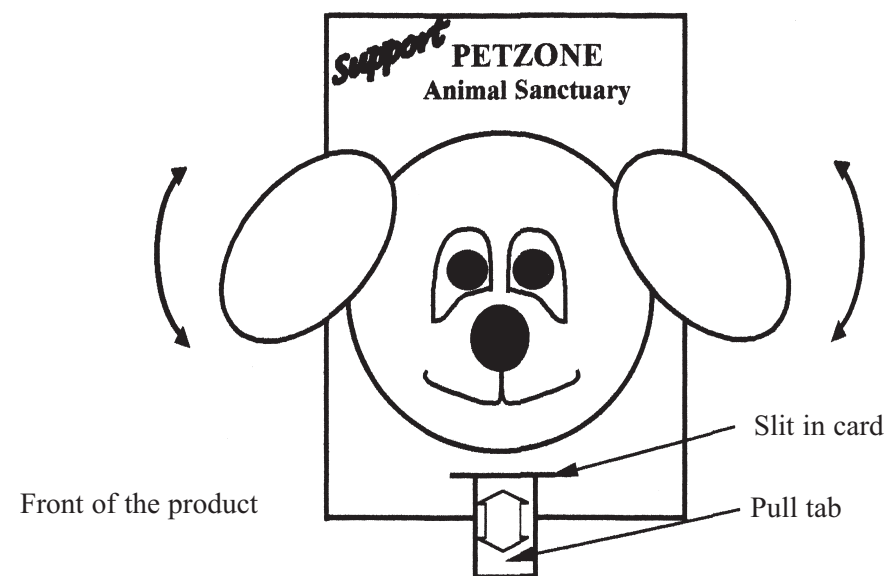


Question 7 is about mechanisms and is worth 13 marks.

Spend about 15 minutes on this question.

7 A promotional product made from card is shown below.

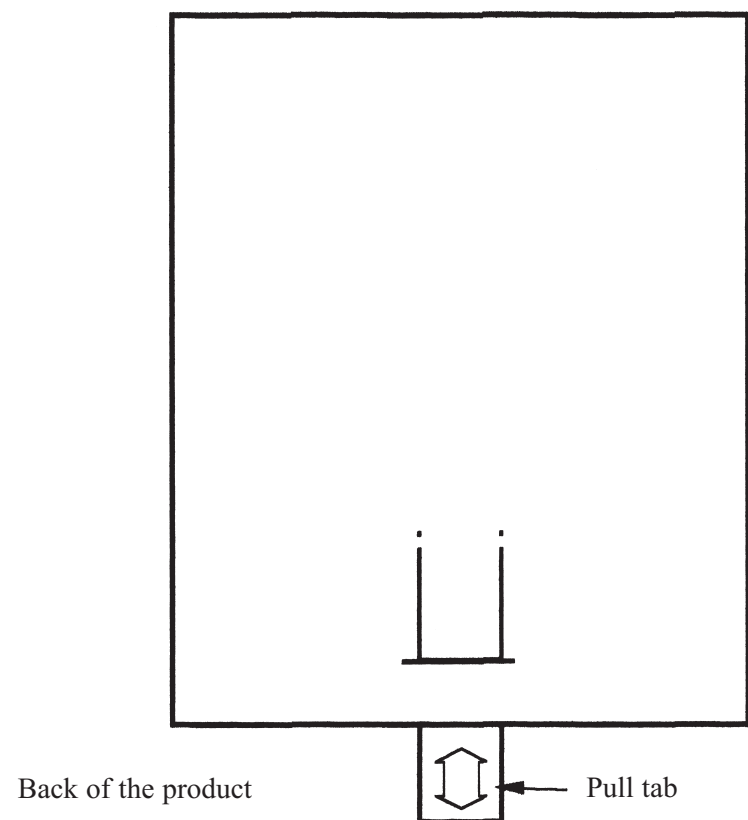
When the tab is pulled the puppy's ears move.



(a) The back of the product, shown below, shows part of the linkage mechanism used to move the ears. Strips of card form the linkage.

On the diagram below, add the working mechanism and include: all card levers and sliders or slits necessary for the ears to move when the tab is pulled.

(6 marks)



(b) Explain how the mechanism works.

.....

.....

.....

.....

.....

.....

(2 marks)

(c) (i) Use notes and sketches to show how you would join the card strips together to make a loose connection.

(3 marks)

(ii) Name any **two** components you have used.

.....

.....

(1 mark)

(1 mark)

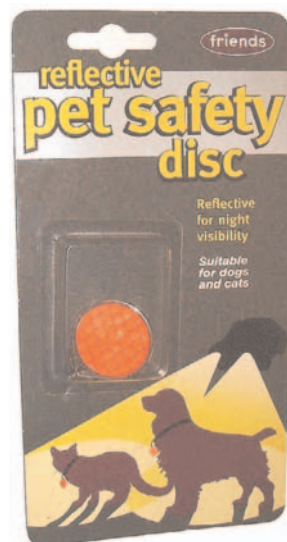
Question 8 is about environmental, cultural and social issues and is worth 19 marks.

Spend about 15 minutes on this question.

8 (a) Explain why, in some cultures and societies, certain colours and images on packages are to be avoided.

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

(b) Blister packs like the one shown are a popular way of packaging products.



(i) Give **one** reason why blister packs are popular with retailers.  
.....  
.....  
(2 marks)

(ii) Give **one** reason why blister packs are popular with consumers.  
.....  
.....  
(2 marks)

(iii) Give **one** reason why blister packs could be considered wasteful.  
.....  
.....  
(2 marks)

(iv) Name the non-renewable resource which provides the raw material for the “blister” element of the package.  
.....  
.....  
(1 mark)

(c) Packaging is thrown away and ends up in *land fill* sites.

(i) Explain what is meant by the term *land fill*.  
.....  
.....  
(2 marks)

(ii) Some materials are *bio-degradable*. What does this mean?  
.....  
.....  
(2 marks)

(d) Designers are encouraged to create products that do not harm the environment.

Name **three** things that a graphic designer can do to reduce damage to the environment.

1 .....  
.....  
.....  
2 .....  
.....  
.....  
3 .....  
.....  
.....  
(6 marks)

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**END OF QUESTIONS**