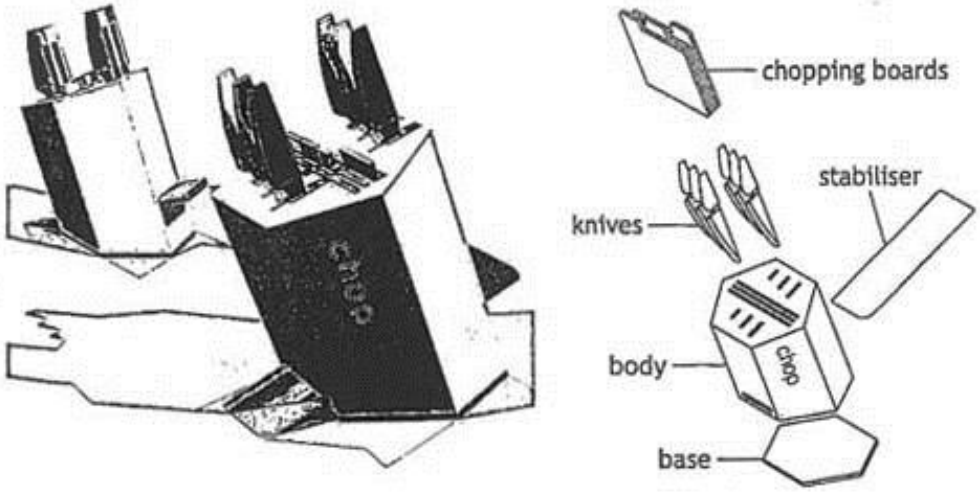
Candidate 2 evidence

Total marks — 80

Attempt ALL questions

1. A knife and chopping board storage system is shown below. The body is made from sheet metal. A CAD technician produced the rendered 3D CAD illustration and the pictorial line drawing shown below.



A 3D CAD model rather than a physical model of the storage system was created during the development stage.

(a) State two reasons why a 3D CAD model was more suitable than a physical model. 2

- It can be put in a simulation to see how it looks and works in real life situations
- It can be sent electronically to colleges and business partners

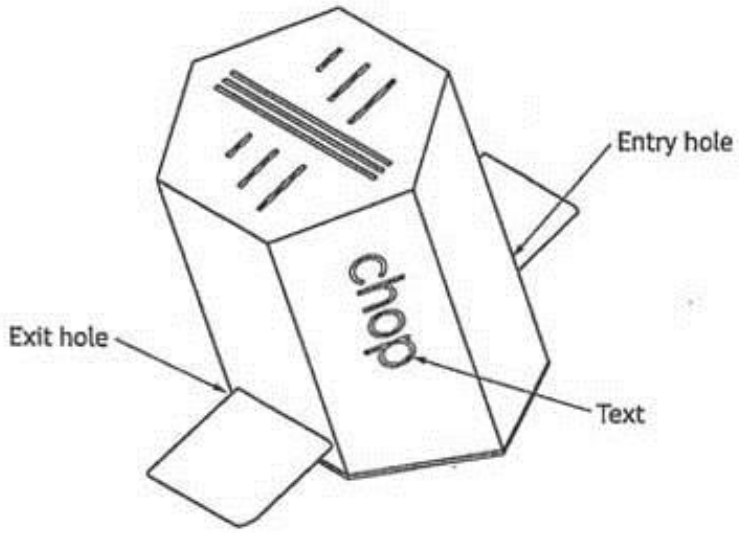
To produce the CAD model the CAD technician was given information about the storage system. One dimension stated: A/F 300mm.

(b) State the meaning of A/F. 1

across flats

1. (continued)

The CAD technician has been asked to produce an appropriate surface development for the storage system and identify where key features will be placed.

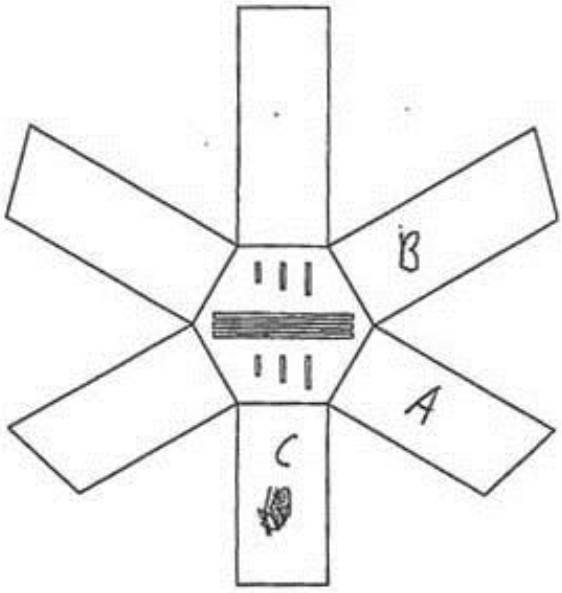


(c) Indicate, on the graphic below, where the Text, Entry hole and Exit hole would be located. 3

Use A to indicate on the panel where the Text would be located.

Use B to indicate on the panel where the Entry hole would be located.

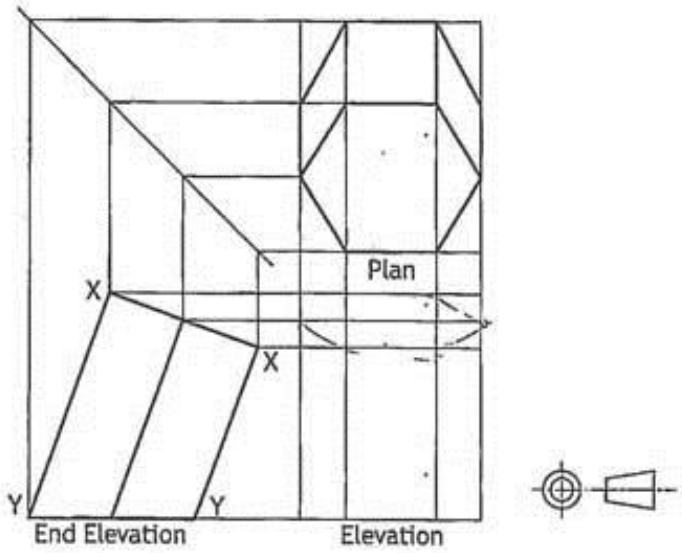
Use C to indicate on the panel where the Exit hole would be located.



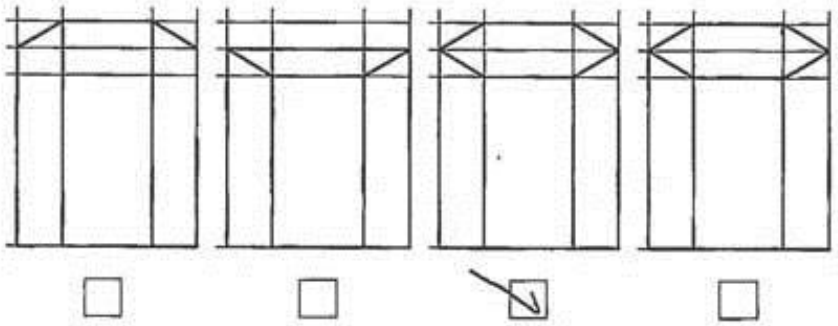
1. (continued)

To aid the production of the storage system the CAD technician was asked to complete the orthographic drawing shown below.

Hidden detail and slots removed for clarity.

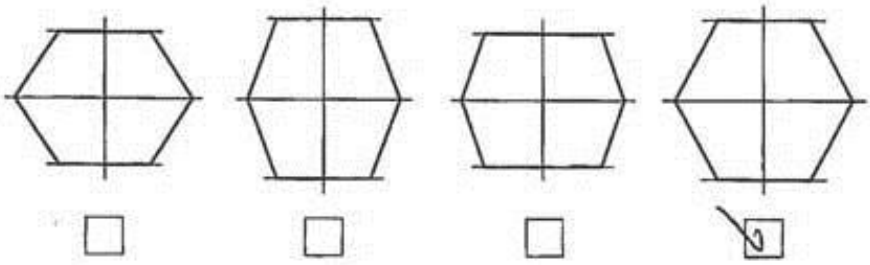


(d) Identify, using a tick (✓), the correct elevation. Ignore wall thickness. 1



A true shape of surface X–X was required.

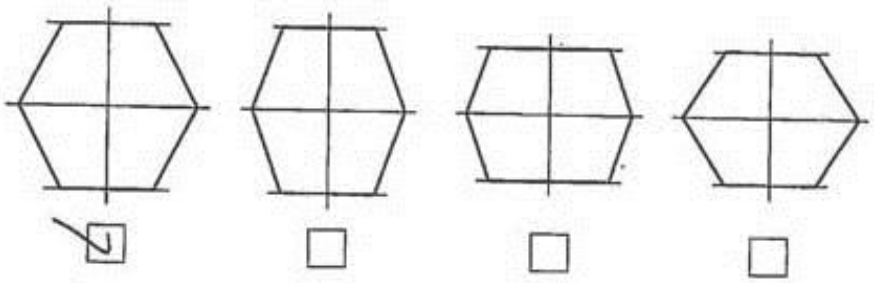
(e) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



1. (continued)

A true shape of surface Y–Y was required.

(f) Identify, using a tick (✓), the correct true shape. Use a ruler or trammel to measure. 1



1. **(continued)**

The CAD technician was then asked to provide surface developments of the body of the knife block, without the top.

(g) Identify the two correct surface developments, shown opposite, of the knife block when opened out at surface generators 'A' and 'B'.

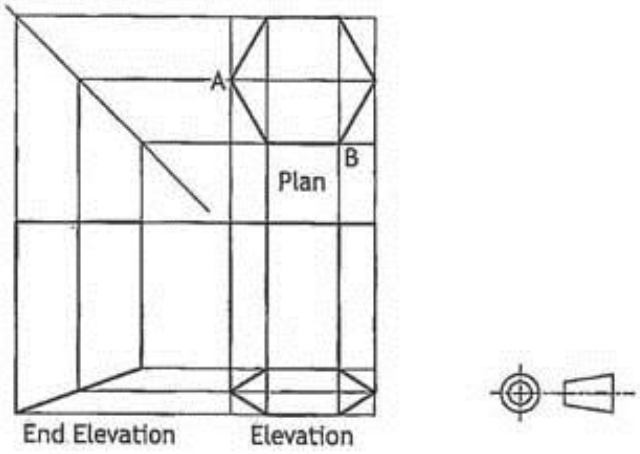
You should refer to the orthographic drawing below.

(i) When opened out at generator A, the correct surface development is view. 1

[6] *Insert number*

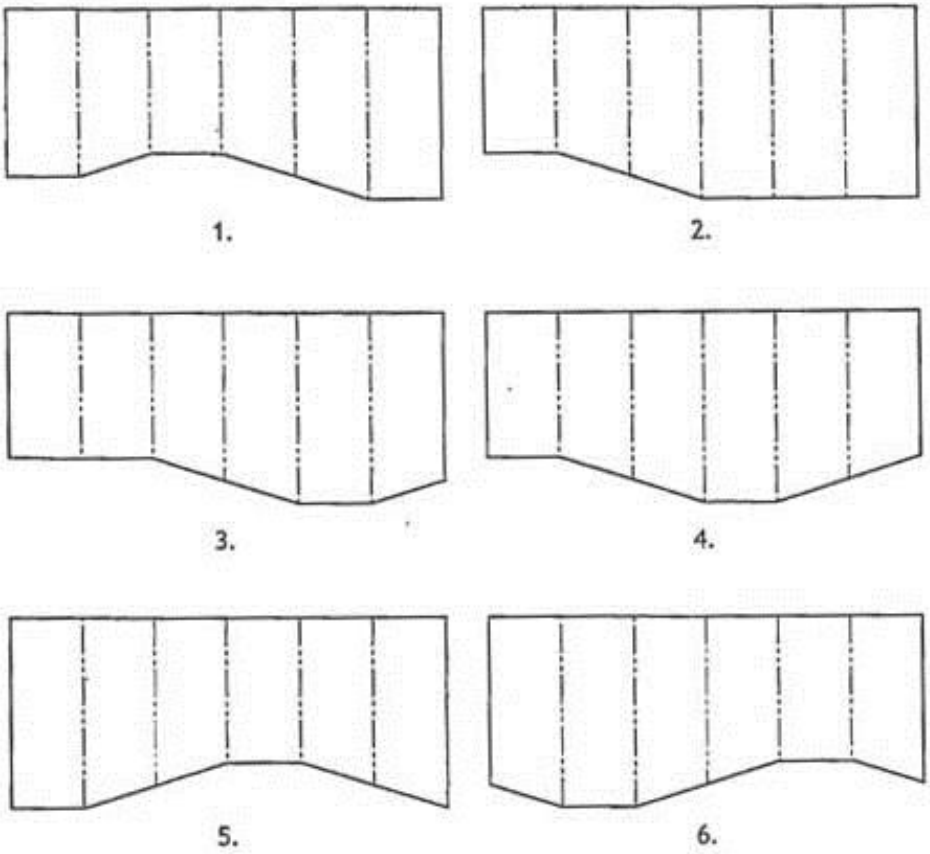
(ii) When opened out at generator B, the correct surface development is view. 1

[4] *Insert number*



1. (continued)

The range of surface developments are show below.



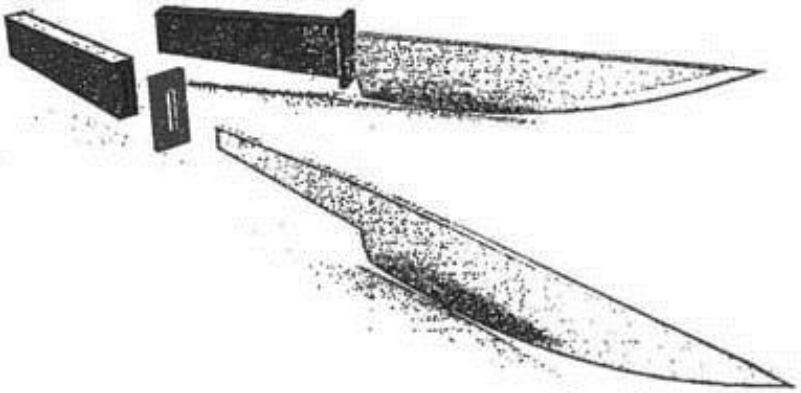
A number of the knife blocks are to be produced from a single sheet of material.

(h) Explain, in terms of environmental impact, why it is important to carefully consider the layout of multiple parts. 1

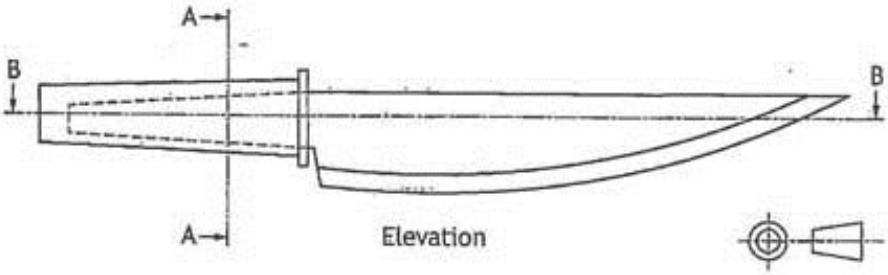
Fitting as many parts on one sheet of material as possible would reduce waste.

1. (continued)

(i) A knife set to complement the knife block is to be produced. Rendered pictorials and orthographic views of one knife are shown below.

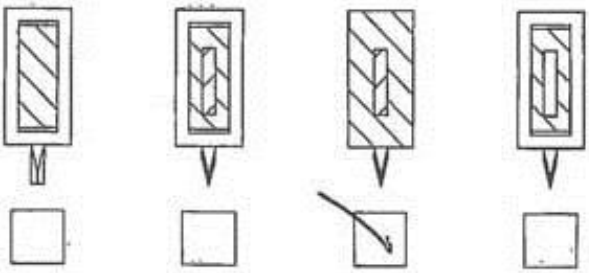


Plan



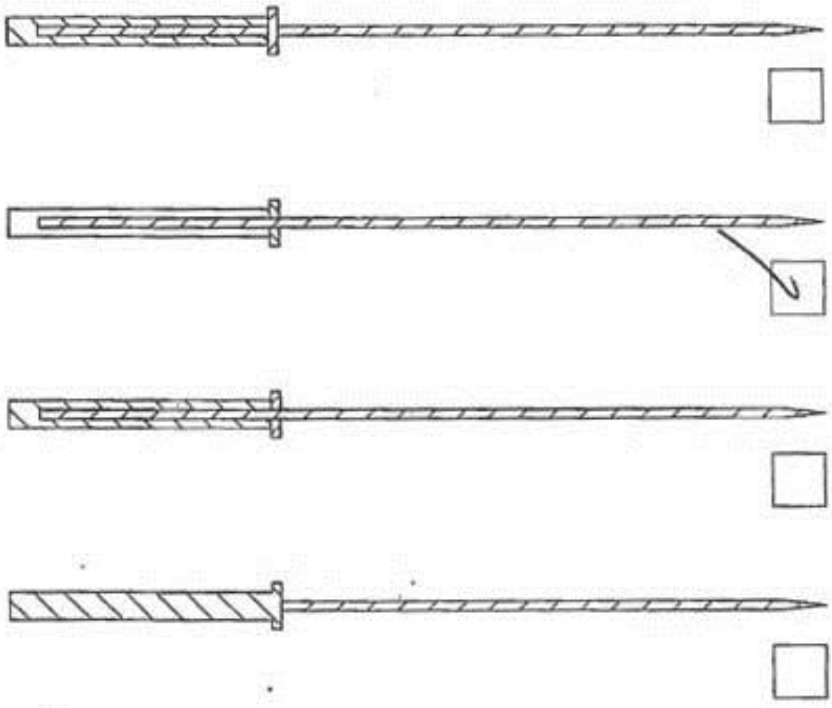
Elevation

(i) Identify the correct sectional end elevation A-A by ticking (✓) a box below. 1

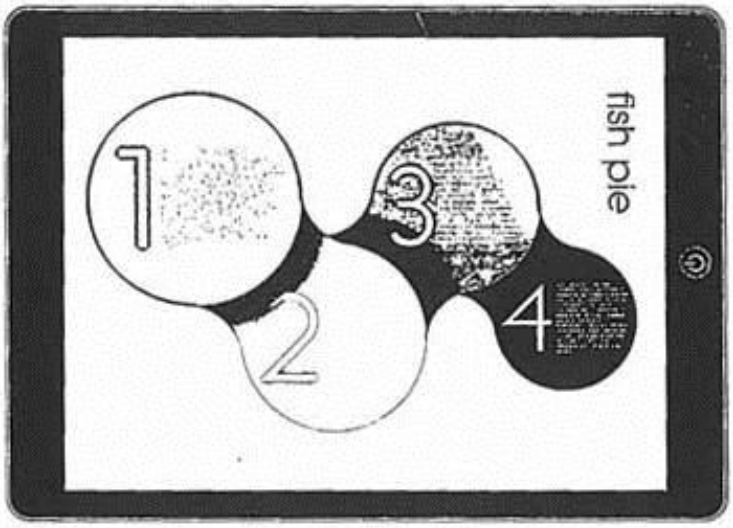


1. (i) (continued)

(ii) Identify the correct sectional plan B-B by ticking (✓) a box below. 1



2. A recipe app has been produced. The graphic artist was asked to ensure that the graphic layout was easy to follow.



(a) Describe three ways, other than the numbering system, that the graphic artist has graphically communicated the sequence of the recipe shown above. 3

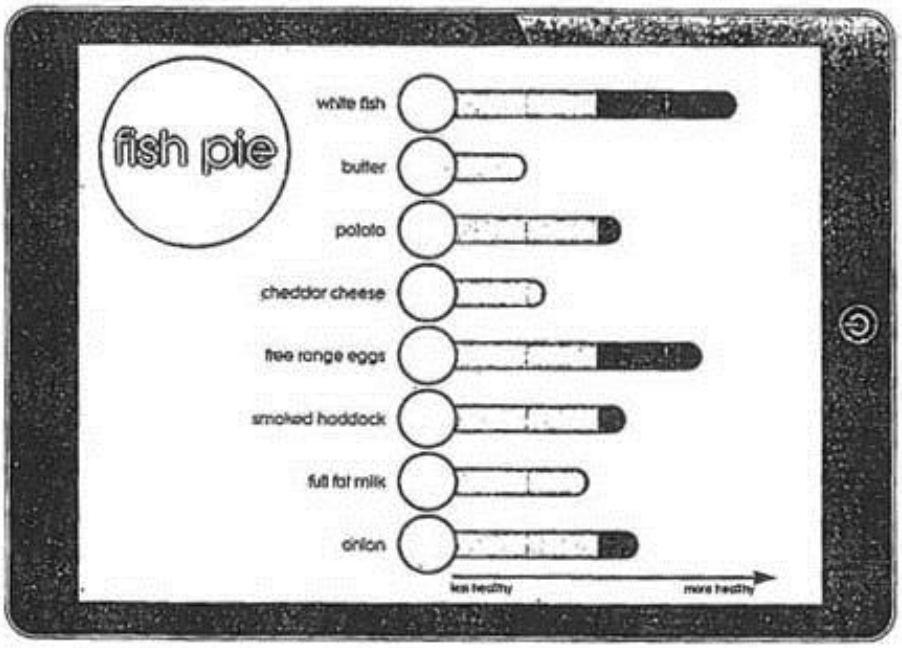
1 - The rainbow, starting from green, was used backwards, in order, to red to show the progression
2 - The circles from One to four got gradually smaller
3 - The instructions go chronologically left to right and are seperated.

(b) Describe two benefits that producing a recipe app, rather than physically printing a recipe book, would have for the environment. 2

No waste from paper and no cutting down trees.
No ink used and no left over packaging i.e. ink cartilage

2. (continued)

The app also contains an additional feature that analyses individual ingredients and calculates the overall health rating of the recipe.



(c) Name the type of graph or chart that was used in the graphic shown above. 1

Bar graph

(d) Describe one way that the graphic artist has graphically communicated the health rating of the individual ingredients. 1

The columns gradually progressed to a darker green.

2. (continued)

Two different sets of statistics that have been provided are shown below.

Statistics A	
Nutritional Data – Nuts	
Cashew	170 Calories, 13g Fat, 8g Carb, 5g Protein, 1g Fibre
Hazelnut	180 Calories, 18g Fat, 4g Carb, 4g Protein, 2g Fibre
Peanut	170 Calories, 14g Fat, 6g Carb, 7g Protein, 2g Fibre
Walnut	210 Calories, 20g Fat, 6g Carb, 5g Protein, 2g Fibre

Statistics B	
Healthy diet plan	
Fruit and Vegetables	33%
Carbohydrates	33%
Protein	12%
Milk and Dairy	15%
Fats and sugars	7%

(e) (i) State the most suitable type of informational graphic to present the data shown in **Statistics A**. 1

bar graph

(ii) Explain why this is an appropriate type of informational graphic to present. 1

You can line up the amount of each thing and compare them to one another.

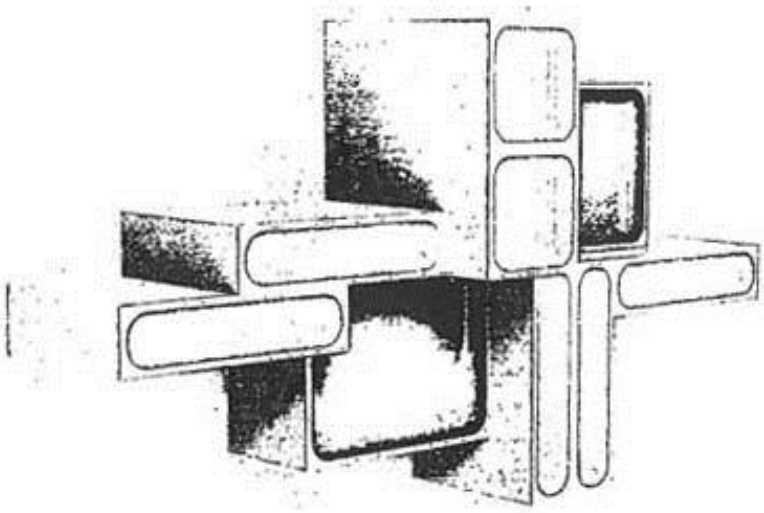
(f) (i) State the most suitable type of informational graphic to present the data in **Statistics B**. 1

Pie chart

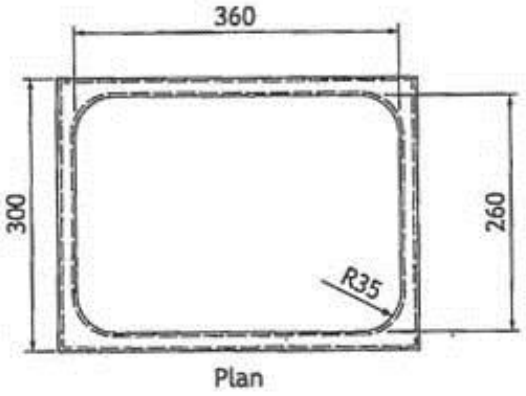
(ii) Explain why this is an appropriate type of informational graphic to present. 1

It makes the information clear and easy to understand

3. A modular lighting system is shown below. There are three sizes of coloured lighting pods that can be arranged in a variety of ways. A rendered 3D CAD illustration is shown below.

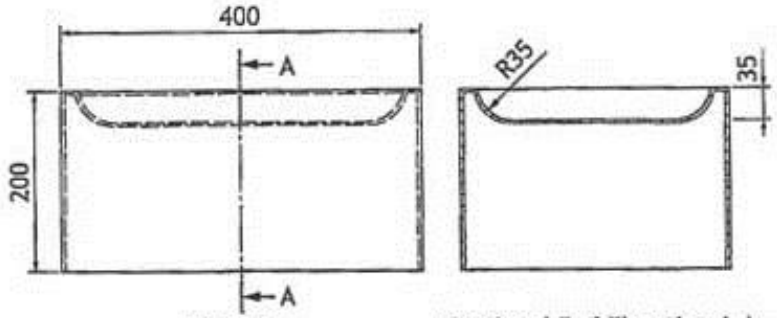


An orthographic drawing of one of the orange lighting pods is shown below.



Plan

Please note:
Wall thickness = 3 mm



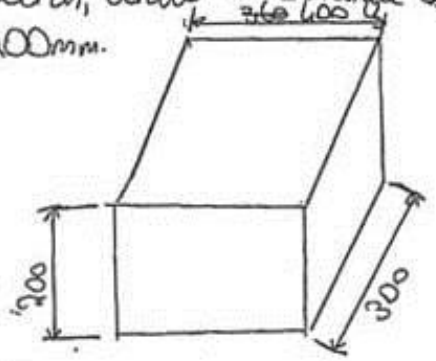
Elevation

Sectional End Elevation A-A

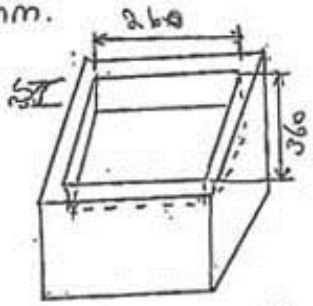
3. (continued)

(a) Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model the orange lighting pod. You may use sketches to support your answer. 6

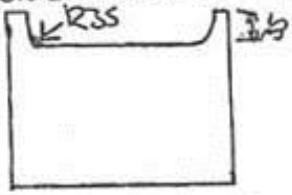
1) On a new sketch, draw a rectangle 400mm by 300mm. Extrude by 200mm.



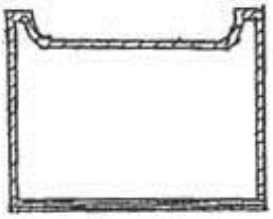
2) Start a new sketch on the top face, sketch a rectangle 360mm by 260mm. Extrude, subtract, by 35mm.



3) On the inside corners of the extrusion, apply a fillet 35mm

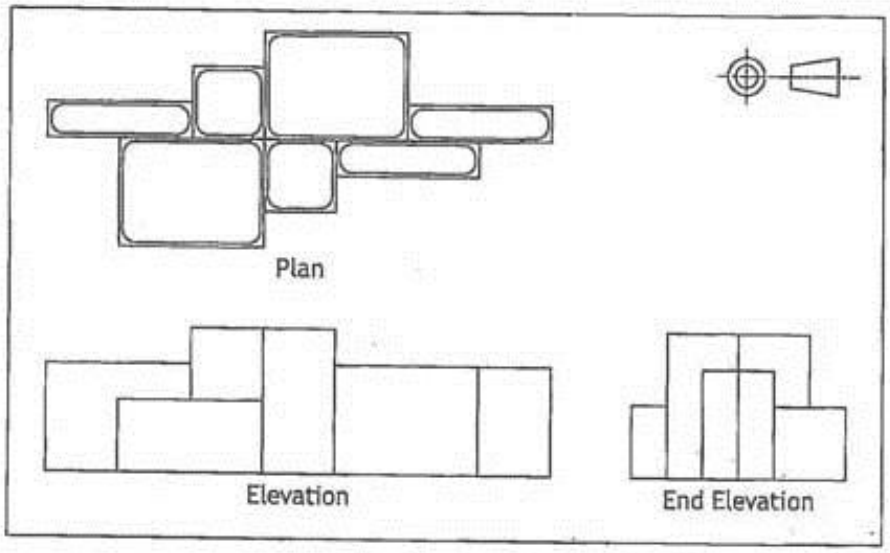


4) Apply a shell to the entire shape, leaving a wall thickness of 3mm. Removing the bottom face



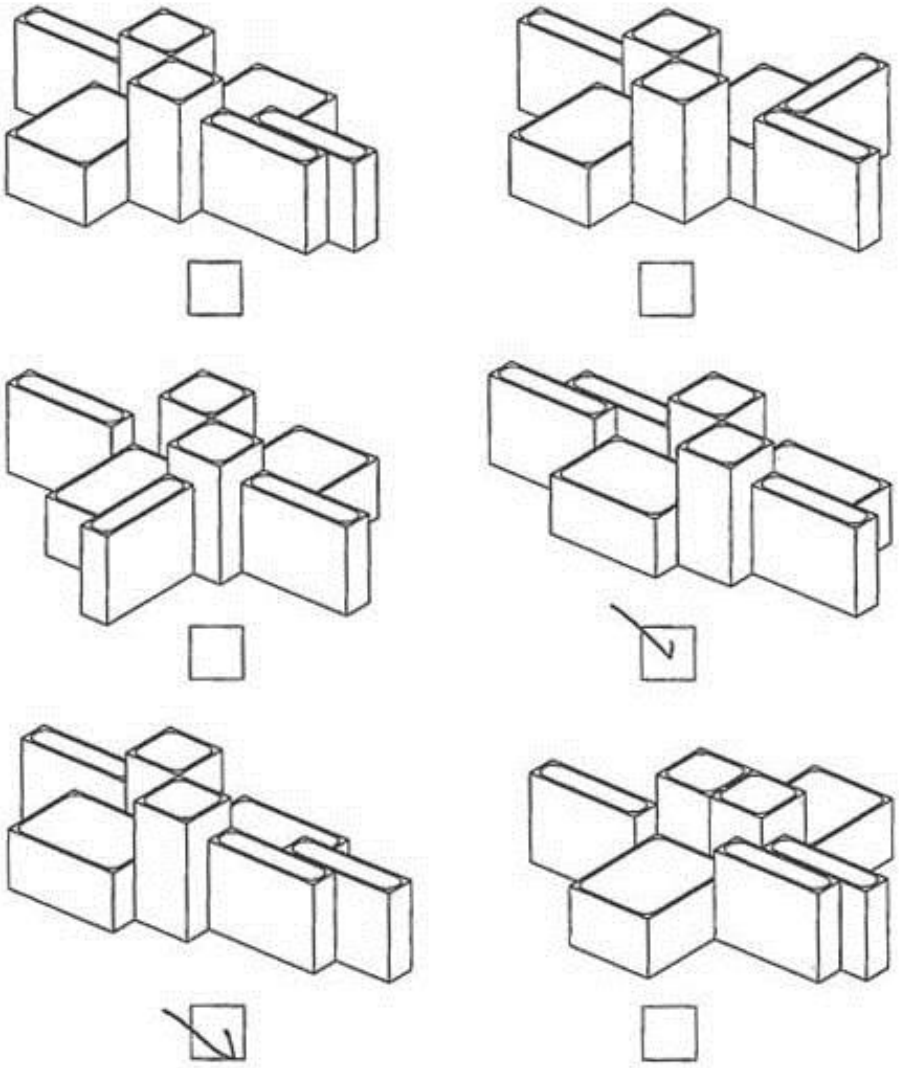
3. (continued)

Orthographic assembly views of an arrangement of the lighting system are shown below. Hidden detail removed for clarity.



3. (continued)

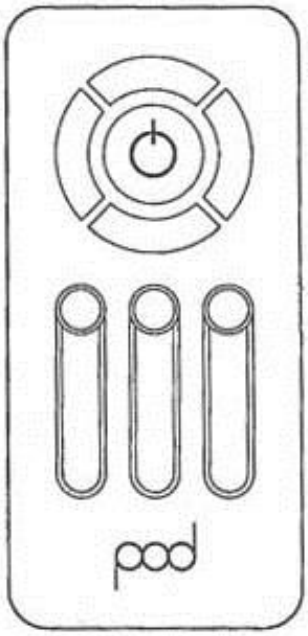
(b) Identify, using a tick (✓), the two pictorial assembly drawings that match the arrangement in the orthographic assembly drawing shown. 2



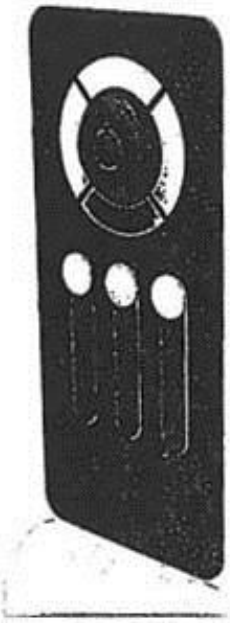
[Turn over

3. (continued)

A 2D CAD line drawing, produced using 2D CAD software, and a 3D CAD model of a control panel for the lighting system are shown below.



2D CAD Line Drawing



3D CAD Model

(c) Explain why the 2D CAD line drawing can be produced more quickly than the 3D CAD model of the control panel. 1

The use of Grid and Snap to Grid can be used for speed.

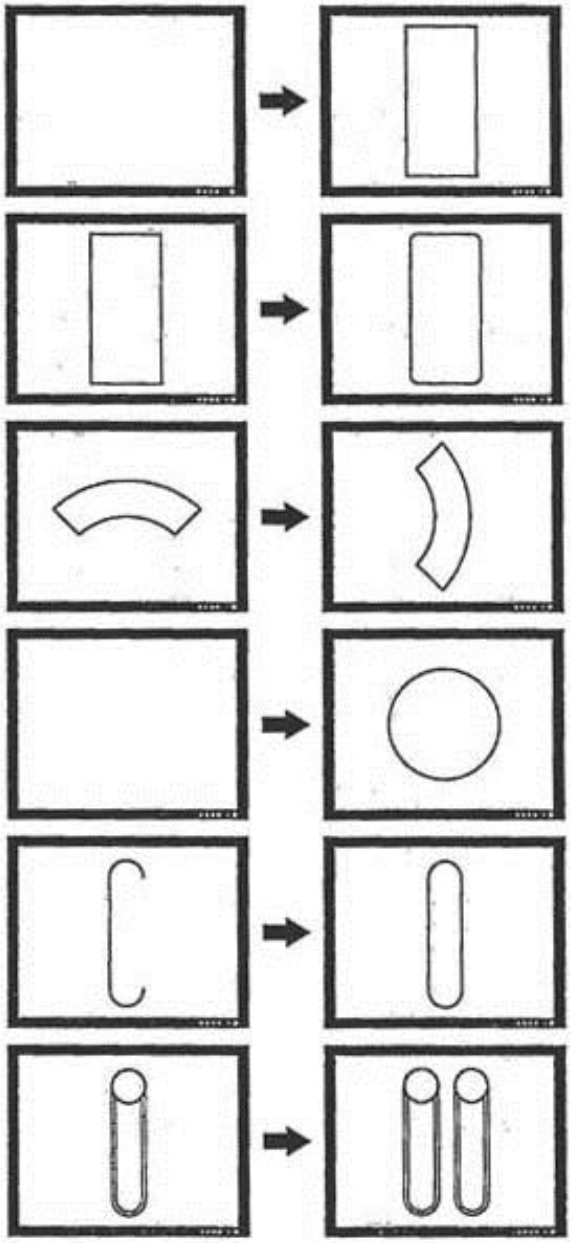
(d) Describe two benefits of a 3D CAD model over a 2D CAD drawing. 2

3D CAD Models can be rendered to look real and they can be placed in animations to show how it works in real life.

3. (continued)

To create the features of the control panel a number of 2D CAD tools were used.

(e) State the name of the single CAD tool used in each case. €



(i) Tool used
Rectangle

(ii) Tool used
Fillet

(iii) Tool used
rotate

(iv) Tool used
Circle

(v) Tool used
Line

(vi) Tool used
duplicate

3. (continued)

Three line types that will be used to complete the 2D CAD drawings to British Standard conventions are shown below.

(f) State the uses of the following line types.

(i) A chain thin line 1

Centre Line

(ii) A continuous thick line 1

Outline

(iii) A long dash dotted thin line, thick at ends. 1

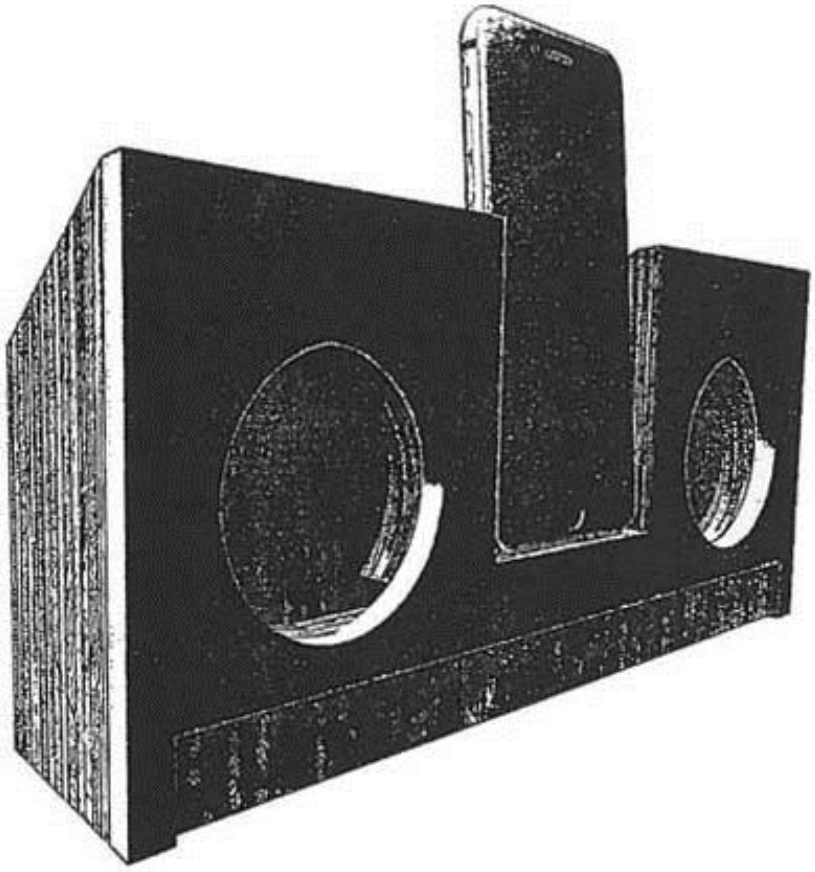
Cutting plane

The 2D CAD drawings are to be drawn using a scale.

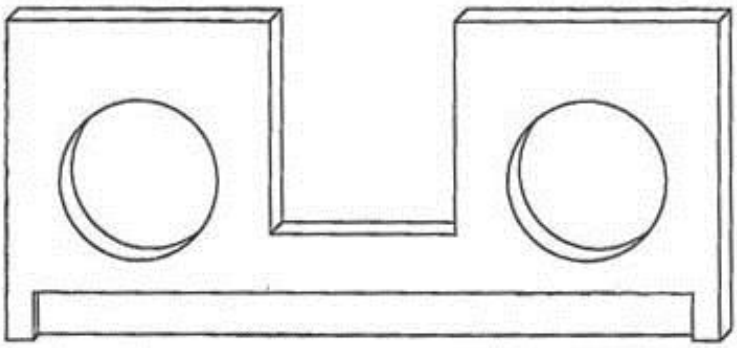
(g) Explain what is meant by the term scale 2:1. 1

The shape is double the original

4. A speaker has been designed using 3D CAD software. A rendered illustration is shown below.



A pictorial view of one of the speaker components is shown below.

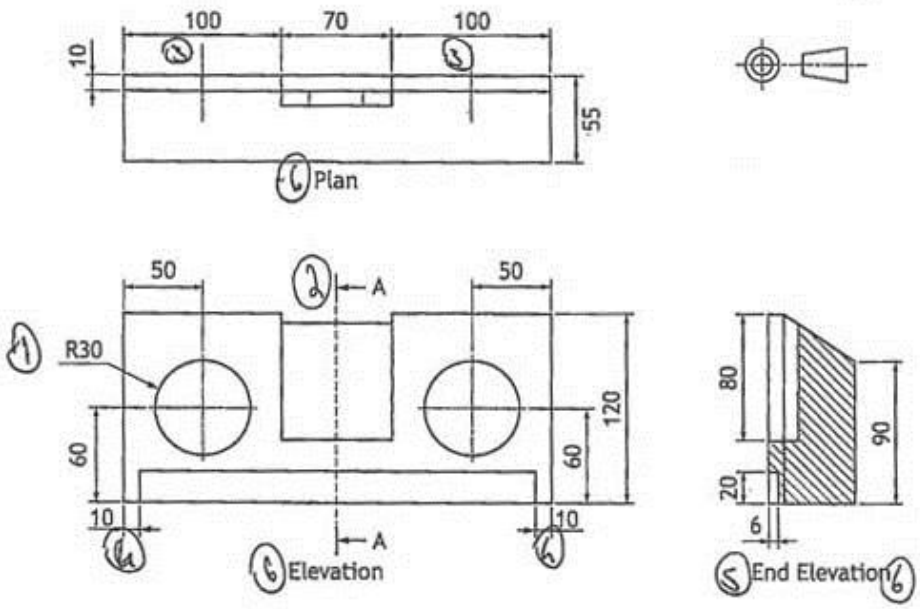


(a) State the type of pictorial view shown above. 1

oblique

4. **(continued)**

A working drawing of the speaker assembly is shown below.



Five pieces of information in the working drawing do not adhere to British Standard conventions.

(b) State the five errors found in this drawing. 5

You may annotate the orthographic drawing to support your answer.

1- The circles should be measured Ø (diameter) instead of R (radius)

2- Cutting Plane AA should be ---- (slash dot chain) instead of a broken chain

3- There shouldn't be centre lines on the plan

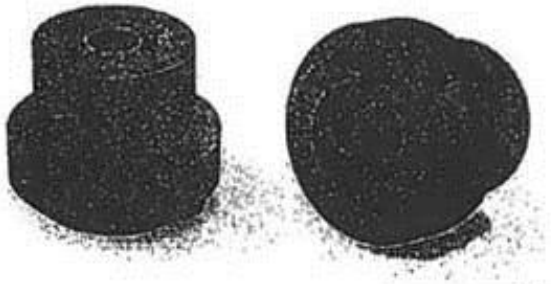
4 - 2 of the same measurements have been shown. Dimension should only be shown once

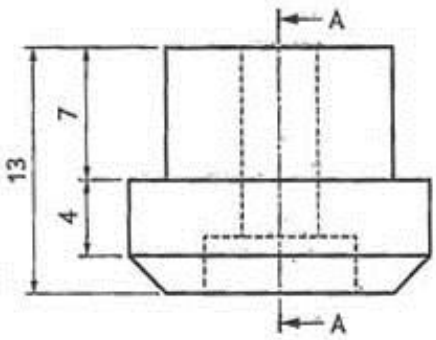
5 - ~~The Rotation~~ The Sectional view has been labelled End Elevation

6 - Writing is in lowercase instead of Upper Case.

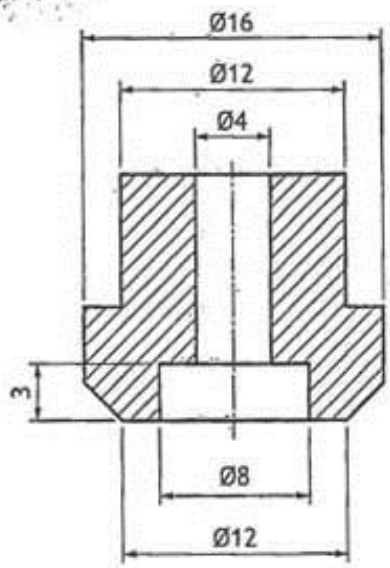
4. (continued)

Rubber feet are to be added to the base. Orthographic views and 3D illustrations of a rubber foot are shown below.





Elevation



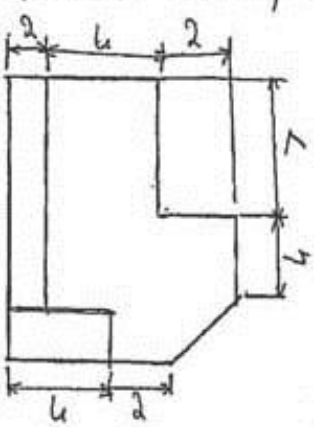
Sectional End Elevation A-A

4. (continued)

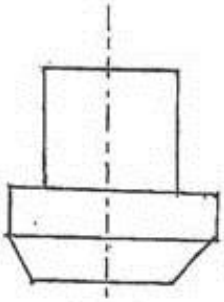
(c) Describe, using the correct dimensions and 3D CAD modelling terms, how the rubber foot, shown opposite, would be produced. 3

You may use sketches to support your answer.

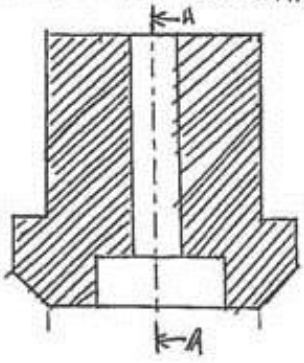
1) On a horizontal plane, sketch the shape shown in this diagram



2) revolve 360° around centre axis



3) Extrude, Cut, the centre shape to leave it hollow



4. (continued)

The orthographic drawings of the speaker were shared online.

(d) Describe two benefits of sharing these orthographic drawings online. 2

- Electronically emailing drawing saves paper and mailing costs.
- Drawings can be easily edited and manipulated by recievers.

(e) Explain why it would be useful to adhere to British Standard conventions and protocols when sharing these types of drawings. 2

- The drawings can be understood everywhere.
- No mistakes would be made and no building faults would happen

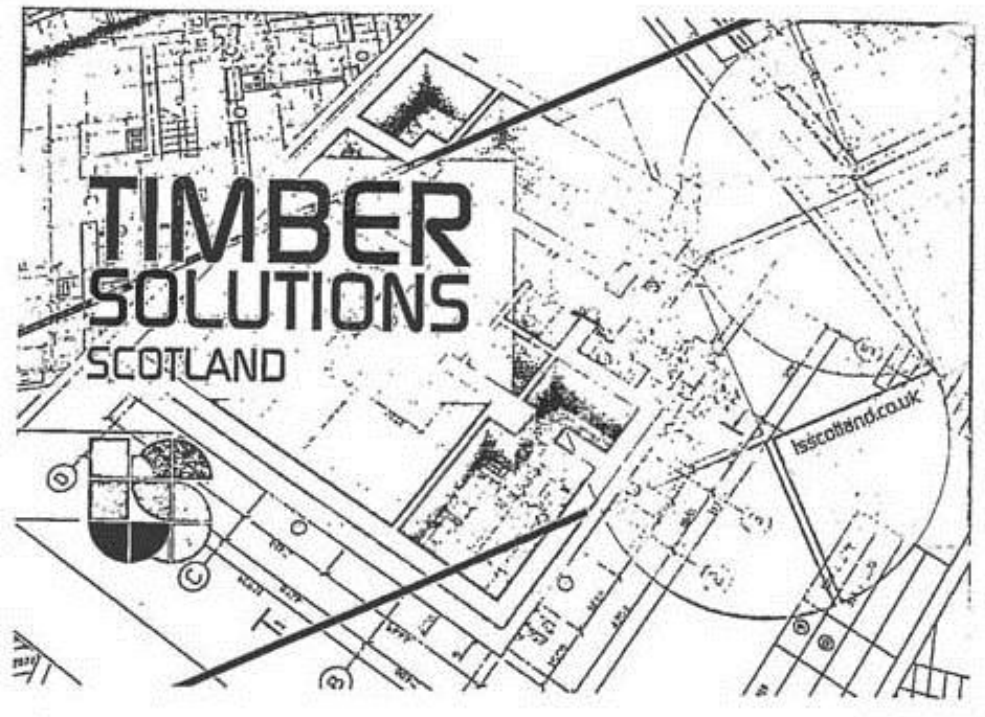
(f) Explain the purpose of the following types of production drawings.

(i) Sectional views To see the inside detail and how everything fits together 1

(ii) Assembly drawings Shows how the parts would look together and to prove they fit. 1

5. Many companies now specialise in applying promotional graphic posters, to advertise services to the public, around commercial vehicles.

A finished layout for a small building company is shown below.



5. (continued)

The design work for the layout was produced by a graphic designer.

(a) Describe two ways in which the graphic designer used the following design elements and principles to enhance the layout.

(i) Line 2

- The lines ontop of an image creates depth
- The lines bleed of the page to give movement on the poster

(ii) Dominance 2

- The brown writing dominates the page as it contrasts the blue and white
- The circle features overtop the image dominate the page as they contrast eachother

(iii) Colour 2

- The orange/brown contrasts with the blue
- The white background image creates a clean and safe overall look.

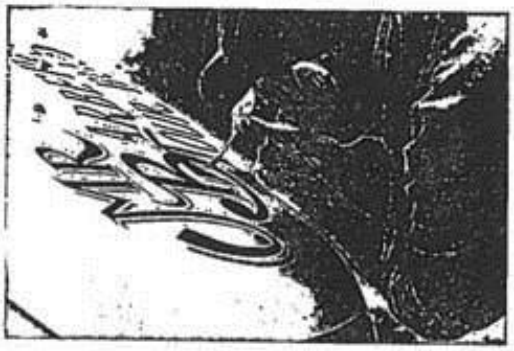
(iv) Unity 2

- The blue lines are in unity with the blue design
- The brown title is in unity with the website written in the same colour

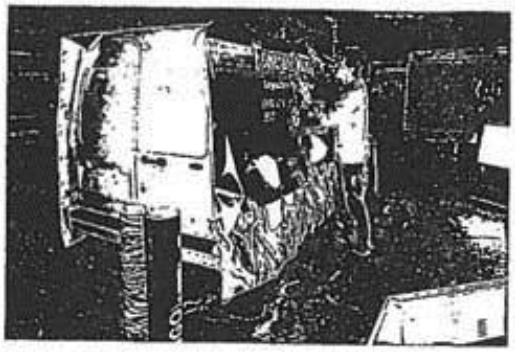
[Turn over

5. (continued)

Vehicles were traditionally hand painted to include information about a company. Modern processes involve printing promotional graphics which are then applied to a vehicle.



Traditional painting technique



Modern printed technique

(b) Describe two advantages to the client of modern printing techniques over traditional painting techniques. 2

- The modern printing method speeds up application meaning more can be produced. It is more efficient
- Modern methods have more accuracy as it is premade, rather than freehanding images which can cause flaws.

6. A graphic designer submitted a draft layout for an architectural magazine article to the editor. The draft is shown below.

The editor provided some feedback to the graphic designer on how to improve the layout.

(a) Describe, using the feedback shown below, four improvements the graphic designer should make to the layout using Desktop Publishing techniques.

(i) *The word 'house' in the heading is difficult to see* 1

Use reverse and make 'house' white so it's white text on a dark background

(ii) *The large column of extended text makes it difficult to read* 1

Use fully Justified text and split the colums into add [illegible]

(iii) *The bottom image would look better without the sky in the background* 1

Use the cutout studio to remove the sky

(iv) *The body text is too close to the edge of the paper* 1

apply a margin to the left side of the page

6. (continued)

The graphic designer used a sans serif font for the heading.

(b) State two reasons why the graphic designer has chosen a sans serif font for the heading. 2

Sans serif fonts have softer edges and it contrasts the other text

When inserting an image, the graphic designer used the handles of the image to increase its size. This resulted in the image being out of proportion, shown below.

(c) Describe how the graphic designer could have resized the image without altering the proportions. 1

Use snap to grid or a scale factor

6. (continued)

During the production of the layout, using desktop publishing software, the graphic designer used guidelines.

(d) Describe two advantages of using guidelines in the creation of promotional layouts. 2

Guidelines keep everything symmetrical and accurate.

It keeps the page clean and easy to follow while producing

[END OF QUESTION PAPER]