Fill in these boxes and read what is printed below.

Full name of centre                                           Town

Forename(s)                                              Surname

Number of seat

Date of birth

Day    Month    Year

Scottish candidate number

Total marks — 80

Attempt ALL questions.

All dimensions are in mm.

All technical sketches and drawings use third angle projection.

You may use rulers, compasses or trammels for measuring.

In all questions you may use sketches and annotations to support your answer if you wish.

Write your answers clearly in the spaces provided in this booklet. Additional space for answers is provided at the end of this booklet. If you use this space you must clearly identify the question number you are attempting.

Use blue or black ink.

Before leaving the examination room you must give this booklet to the Invigilator; if you do not, you may lose all the marks for this paper.
1. A range of marker pen packaging is shown below.

(a) Identify the correct group of 3\textsuperscript{rd} angle orthographic views for the lid by ticking (✓) a box below. Ignore wall thickness.
1. (continued)

(b) Identify the correct group of 3rd angle orthographic views for the base by ticking (✓) a box below. Ignore wall thickness.

To complete the 2D CAD drawings required for manufacture, the CAD technician has been asked to produce the surface developments for the lid and base.

(c) Identify the correct surface development of the lid by ticking (✓) a box below.
1. (continued)

(d) Identify the correct surface development of the base by ticking (✓) a box below.

[Diagrams of different surface developments]

Orthographic views of the assembled packaging are shown below.

(e) Identify the two pictorial assembly drawings that match the arrangement shown in the orthographic assembly by ticking (✓) a box below.

[Diagrams of orthographic assembly drawings]
[Turn over for next question

DO NOT WRITE ON THIS PAGE
2. A graphic designer created a layout containing various infographics, shown below.
2. (continued)

(a) State the types of graph/chart shown at

(i) graph/chart A ___________________________ 1

(ii) graph/chart B ___________________________ 1

(b) Explain, giving reasons for your answer, why graph/chart A is appropriate for communicating this type of information. 2

__________________________________________

__________________________________________

__________________________________________

(c) The graphic designer created a graph based on a photograph of a house to show the proportions of energy consumption in a home.

Describe two ways the designer has used proportion to convey the different percentages of consumption. 2

__________________________________________

__________________________________________

__________________________________________

The graphic designer used DTP software to edit the image of the house by removing the background.

(d) (i) State the name of the DTP tool used to remove the background from an image. 1

__________________________________________

(ii) Explain the advantages of removing the background from the image of the house. 1

__________________________________________

[Turn over
2. (continued)

Details from the layout are shown below.

(i)

(ii)

(e) State the name of the DTP technique shown on the layout at

(i) ___________________________  

(ii) ___________________________  

1

1

(f) Explain two ways the graphic designer can reduce the impact on the environment when printing the layout.  

__________________________________________________________________________  

__________________________________________________________________________  

__________________________________________________________________________  

2
3. An online portfolio site where designers can upload their CV and examples of design work is shown below.

In order for a designer to build their portfolio online, they need to create digital copies of their manual work.

(a) State two input devices that could be used by designers to create digital files of their manual work.

(b) Explain three advantages to the designer of having their portfolio published online rather than being printed. You should not refer to environmental advantages in your answer.
3. (continued)

A draft of a CV created using DTP software is shown below.
3. (continued)

(c) Explain two advantages to the designer of using DTP software to produce the CV.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(d) Describe two ways the designer has used each of the following design elements and principles in the CV.

(i) Alignment

________________________________________________________________________
________________________________________________________________________

(ii) Unity

________________________________________________________________________
________________________________________________________________________

(iii) Line

________________________________________________________________________
________________________________________________________________________

The designer used graphic icons to represent some information on the CV, as shown below.

INTERESTS

TRAVELLING  MUSIC  GOLF  CYCLING

(e) Explain why the designer used graphic icons.
4. A 3D CAD illustration of a self-assembly children’s toy is shown below.

(a) Explain two reasons why this type of graphic would be useful in the promotion of the toy.
4. (continued)

The toy is made up of a number of parts. Two samples of assembly instructions are shown below: an exploded isometric drawing and a 3D CAD illustration.

[Image: Exploded Isometric Drawing]

Position the front panel in front of the main body and use 2x M10 bolts to secure the parts together.

[Image: Rendered Illustration]

Position the front panel in front of the main body and use 2x M10 bolts to secure the parts together.

[Turn over]
The designers need to decide on either exploded isometric drawings or rendered illustrations to be used in the assembly instructions.

(b) Explain one advantage and one disadvantage of each graphic. Ensure you do not use the same answer more than once.

**Exploded isometric**

**Advantage**

________________________________________________________________________________________

________________________________________________________________________________________

**Disadvantage**

________________________________________________________________________________________

________________________________________________________________________________________

**3D CAD illustration**

**Advantage**

________________________________________________________________________________________

________________________________________________________________________________________

**Disadvantage**

________________________________________________________________________________________

________________________________________________________________________________________
4. (continued)

An orthographic drawing of the children’s toy is shown below. The orthographic drawing contains errors that do not conform to British Standards.

(c) State six errors shown in the orthographic drawing.
4. (continued)

A title block is to be added to the final orthographic drawing. The title block will include the symbol shown below.

(d) (i) Describe the purpose of this symbol.

(ii) State three other pieces of information that should be included in a title block.
5. A new line of nail varnishes has been produced by a cosmetics manufacturer. The bottles are stackable for ease of storage and display. 3D CAD illustrations are shown below.

Orthographic drawings and a pictorial view of the bottle body are shown below.

<table>
<thead>
<tr>
<th>PLAN</th>
<th>DETAIL B</th>
<th>SECTIONAL ELEVATION A-A</th>
<th>END ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ø16</td>
<td>Ø14</td>
<td>Ø20</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
<td>8</td>
<td>1mm wall thickness</td>
</tr>
<tr>
<td>50</td>
<td>8</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

SECTIONAL ELEVATION A-A
5. (continued)

(a) Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model the bottle body. You may use sketches to support your answer.
5. (continued)

Orthographic drawings and a pictorial view of the applicator are shown below.

Orthographic drawings and a pictorial view of the applicator are shown below.
5. (continued)

(b) Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model the applicator. You may use sketches to support your answer.
(c) The nail varnish is available in a wide range of colours, tints and shades. Complete the table below by adding the missing information.

<table>
<thead>
<tr>
<th>Colour</th>
<th>Primary or secondary</th>
<th>Advancing or receding</th>
<th>Mood</th>
</tr>
</thead>
<tbody>
<tr>
<td>red</td>
<td>primary</td>
<td>receding</td>
<td>dangerous</td>
</tr>
<tr>
<td>green</td>
<td>secondary</td>
<td>receding</td>
<td></td>
</tr>
<tr>
<td>blue</td>
<td></td>
<td>receding</td>
<td>formal</td>
</tr>
<tr>
<td>orange</td>
<td>secondary</td>
<td></td>
<td>appetising</td>
</tr>
<tr>
<td>yellow</td>
<td></td>
<td>advancing</td>
<td></td>
</tr>
</tbody>
</table>

(d) Explain the difference between a tint and a shade.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

(e) Explain how tertiary colours are created.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
5. (continued)

Illustrated views of two bottles are shown below. There are three stages in the assembly.

(f) State, using 3D CAD terms, how you would assemble and constrain the components shown above.

Corresponding surfaces and/or edges have been indicated for you.

(i) Constraint used

(ii) Constraint used

(iii) Constraint used

[Turn over]
6. An outdoor play system has been produced. Various arrangements can be made using four tunnel sections. Each section is colour coded on the inside. A 3D CAD illustration and pictorial line drawings are shown below.

![3D CAD illustration and pictorial line drawings](image)

### Pictorial Line Drawings

Section 1  
Section 2  
Section 3  
Section 4

(a) An incomplete parts list for the 3D illustration is shown below. Complete the table below by adding the missing information. Use the arrangement shown in the rendered 3D CAD illustration above.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Section 1</td>
<td>6</td>
</tr>
<tr>
<td>Section 2</td>
<td></td>
</tr>
<tr>
<td>Section 3</td>
<td>magenta</td>
</tr>
<tr>
<td>Section 4</td>
<td></td>
</tr>
</tbody>
</table>
6. (continued)

(b) Orthographic drawings and a pictorial view of one of the tunnel sections is shown below.

Describe, using the correct dimensions and 3D CAD modelling terms, how you would use 3D CAD software to model section 4. You may use sketches to support your answer.
6. (continued)

An orthographic assembled plan of one arrangement is shown below.

(c) Identify the two correct pictorial assembly drawings that match the orthographic plan shown above by ticking (✓) a box below.

[Diagram of orthographic assembled plan]

[Diagram of pictorial assembly drawings]

[Options for selection]

[END OF QUESTION PAPER]