AH

National
Qualifications
2023 MODIFIED

Mark

X835/77/01

Graphic Communication

THURSDAY, 11 MAY
1:15 PM – 3:15 PM

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.

SQA ©

A/PB

Total marks — 80

Attempt ALL questions

1. A suite of graphic items has been produced for the Climb On activity centre.

   Refer to **supplementary sheet 1 for use with question 1 (a) to 1 (d)**.

   The Climb On logo, shown in **Graphic 1** is included in all the graphic items.

Graphic 1
company logo

Graphic 2
car window sticker

Graphic 3
entrance hall poster

Graphic 4
reusable coffee cup

   (a) Explain the purpose of including the company logo on each graphic item. **2**

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1. **(continued)**

(b) Describe three ways negative space has been used across the suite of graphics. **3**

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[Turn over

1. (continued)

The company logo is also used on the Climb On website.

(c) Explain three factors that must be considered when working across printed and digital media.

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1. (continued)

The designer used a photograph to produce the climbing figure graphic in the logo.

(d) Describe the process of converting a photograph into a solid colour fill image. **2**

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[Turn over

2. A company produces 3D printed models and rendered illustrations for architects, structural engineers and model makers.

The company does not accept STEP files for 3D printed models. Customers have to submit STL files.

(a) Explain, giving two reasons, why STEP files must be converted to STL files for 3D printing.

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(b) Explain how each piece of information listed could be used to ensure the success of a 3D print.

3

Volume _____

_____

Centre of mass _____

_____

Model mass _____

_____

2. (continued)

The company have produced the rendered illustration, generated from a CAD model, shown on **supplementary sheet 2**.

Refer to **supplementary sheet 2 for use with question 2 (c)**.

(c) Describe how each of the illustration techniques listed have been used in the production of the rendered illustration.
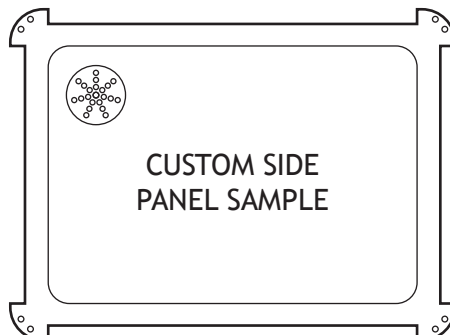
6

Volumetrics _____

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Bump mapping _____

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Image-based lighting (IBL) _____

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[Turn over

3. A company produces custom computer casings and components for computer enthusiasts.

Components such as side panels are manufactured using laser cutting. The company has to convert models to technical file formats to do this.
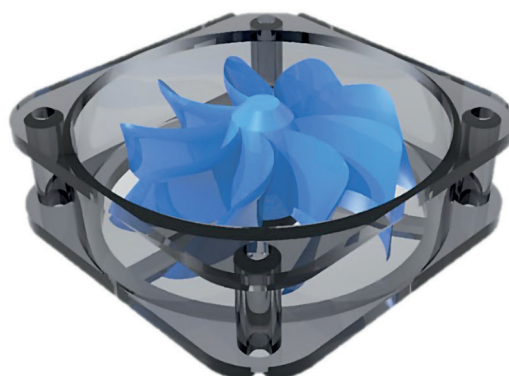

CUSTOM SIDE
PANEL SAMPLE

(a) State the name of a suitable technical graphic file format used for laser cutting and explain two reasons why it is appropriate for the production of a side panel.

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3. (continued)

A computer fan and casing design produced by the company using CAD/CAM techniques is shown below.

Refer to **supplementary sheet 3 for use with question 3 (b) and 3 (c)**.

(b) Describe the purpose of symbol A shown on **supplementary sheet 3 for use with question 3 (b) and 3 (c)**.

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A tolerance will be applied to the casing location pegs. This will affect the minimum and maximum size of distance Y shown on the section C–C view.

Refer to **supplementary sheet 3 for use with question 3 (b) and 3 (c)**.

(c) Calculate the minimum and maximum size of dimension Y.

2

   (i) Minimum size _____

  (ii) Maximum size _____

[Turn over

3. (continued)

The fan component is made using a combination of solid and surface modelling.

Refer to **supplementary sheet 4 for use with question 3 (d)**.

(d) Describe the 3D CAD modelling techniques used to create the fan blade component.

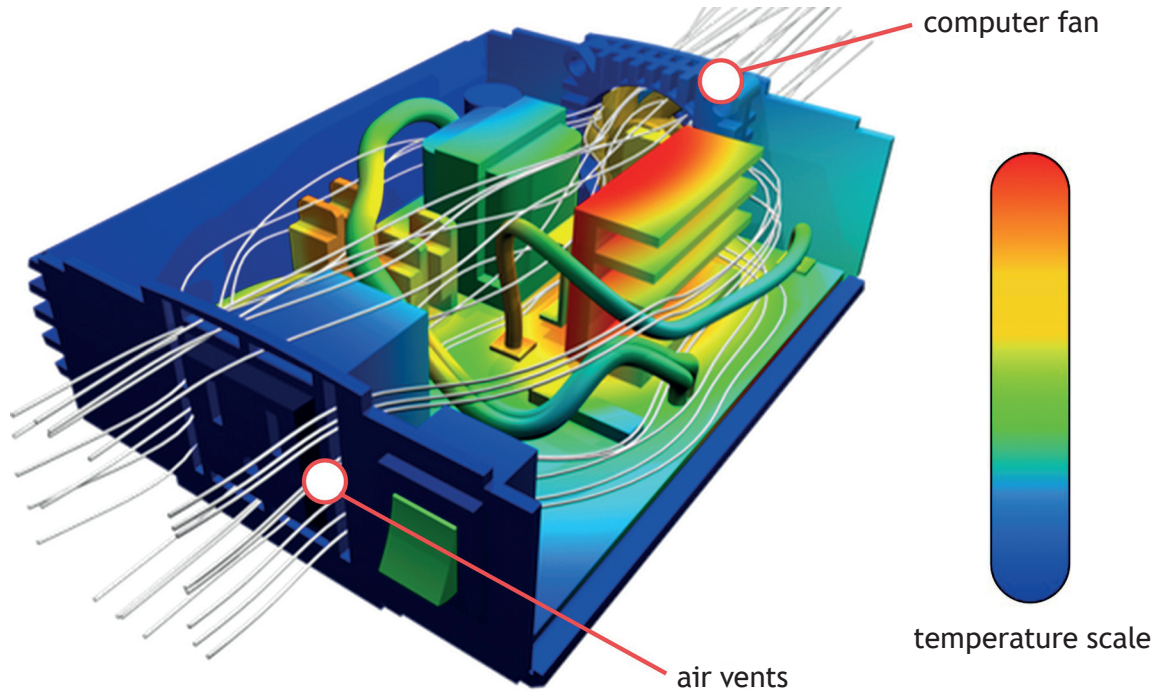You must refer to loft, offset thickness, and irregular fillet in your answer.   **8**

3. (d) (continued)

[Turn over

3. **(continued)**

During the design phase of the fan and casing the company carries out digital testing by simulating the cooling of internal components.

computer fan

temperature scale

air vents

(e) Describe what changes might be made to the design as a result of this digital testing method.

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3. (continued)

Computer casings and components are delivered to customers for self-assembly at home. To support customers with self-assembly the company provides a video. This can be downloaded onto a digital media device as an alternative to printed assembly instructions.

Two screenshots from the video are shown below.

(f) Describe four advantages for the consumer of using video over printed instructions. Assume there is a reliable Wi-Fi/4G signal and a fully operational digital media device.

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3. (continued)

(g) Describe one advantage and one disadvantage for the consumer of using the mov file type for the animation.

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4. A graphic designer has developed a book sleeve design for a client using DTP software. They have sent the design to a commercial printer to obtain a print proof for their client.

Refer to **supplementary sheet 5 for use with question 4.**

(a) Explain why colour space, bleed area and dots per inch (DPI) are important when producing printed media.

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[Turn over

4. (continued)

An extract of the print specification is shown below.

canvas 690 mm × 230 mm
quantity 20 000 copies
textured paper 140 gm^2
bleed 3 mm
CYMK colours

(b) Explain, with reference to the print specification extract, why offset lithography was chosen for the book sleeve.
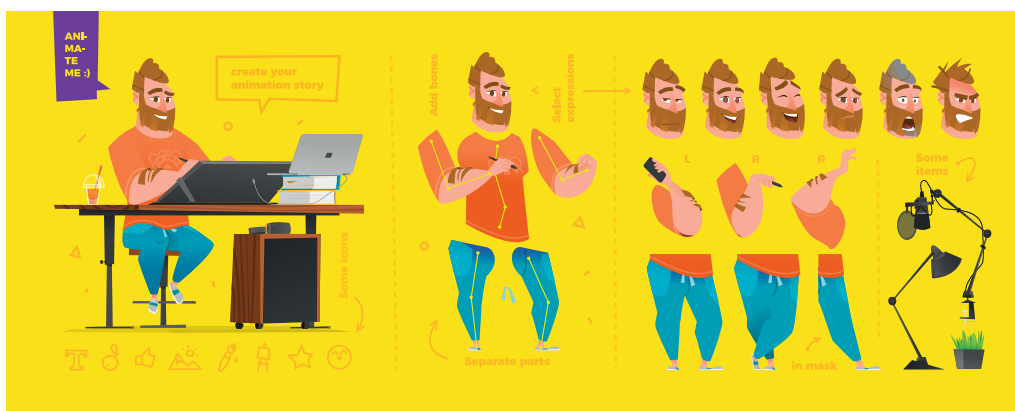
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(c) The client was posted a screenshot of the book sleeve, printed on glossy paper using an ink-jet printer.

Explain why this is of limited value in assessing the quality of the print.

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5. An interactive media design team has developed a game for a mobile device. It involves assembling the character shown below, positioning him in a scene and then animating movement.

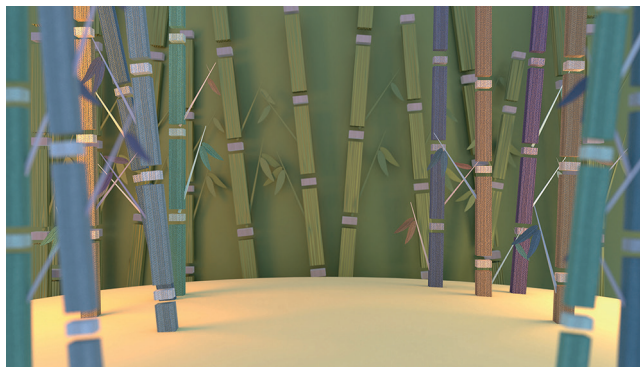(a) Explain how motion capture and motion tweening could be used in the creation of the game.

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[Turn over

5. (continued)

One designer created the parts of character, another designer created the scene in the background. They used ai and png files when carrying out this work.

character   scene

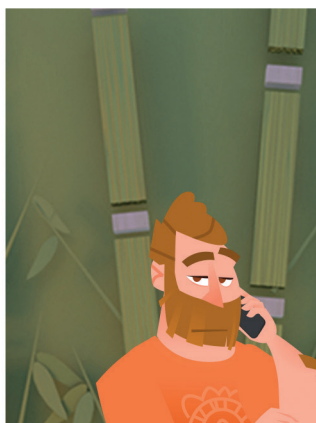(b) Explain one benefit that each file format gives to the designers. **2**

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5.   (continued)

When the character is correctly assembled and rigged, an animation is activated, showing the character completing a task.

The images below show screenshots of an animation sequence.

screenshot 1   screenshot 2   screenshot 3

(c) Describe how the following design elements and principles have been used to enhance the animation:

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-   dynamic effects
-   depth of field
-   rule of thirds.

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5. (continued)

The interactive media design team wants to improve the user experience.

(d) Describe how the team could use post editing of video files to make the game more engaging.

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6. A town planner developed a location plan for a housing development.

Refer to **supplementary sheet 6 for use with question 6**.

(a) Explain why underground surveys are carried out before building projects start.

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Various professionals will use the information contained in the location plan of the housing estate.

Refer to **supplementary sheet 6** for the location plan.

You must give a different response for each question about the location plan.

(b) (i) Describe how a landscape architect will use two pieces of information shown on **supplementary sheet 6**.

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[Turn over

6. (b) (continued)

(ii) Describe how a quantity surveyor will use two pieces of information shown on **supplementary sheet 6**.

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(iii) Describe how construction trades will use two pieces of information shown on **supplementary sheet 6**.

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The location plan was made available to potential buyers.

(c) Identify two layers that could be added to the location plan and explain how they would improve communication with potential buyers.

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[END OF QUESTION PAPER]

ADDITIONAL SPACE FOR ANSWERS

ADDITIONAL SPACE FOR ANSWERS

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