FOR OFFICIAL USE

National Qualifications 2024

Mark

X835/77/01 Graphic Communication

THURSDAY, 16 MAY
9:00 AM – 11:30 AM

X8357701

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 — 90

Attempt ALL questions.

You may use a calculator.

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.

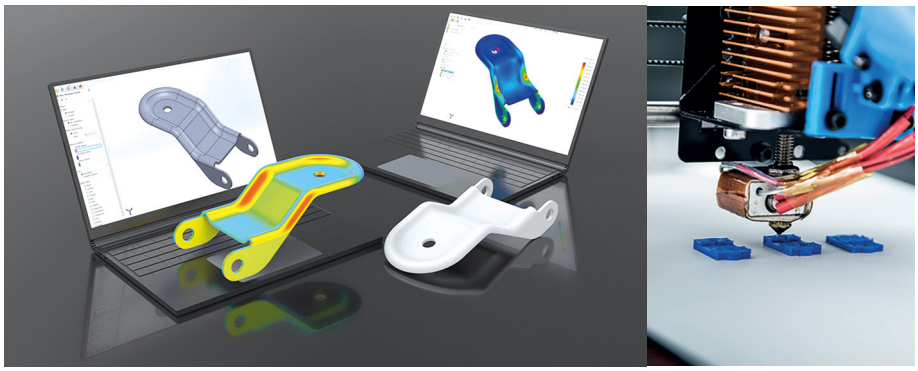
SQA ©

X835770101

Total marks — 90

Attempt ALL questions

1. A design company produces 3D printed replacement components.

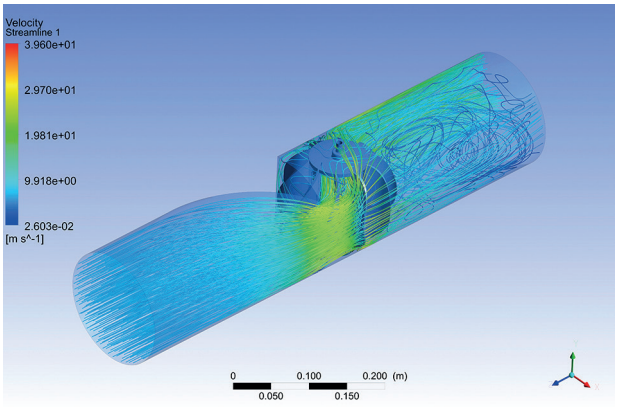


The company uses digital testing methods to test designs before 3D printing.

(a) Describe two ways a designer could use FEA testing methods in the design of components. **2**

1. **(continued)**

The company have been asked to 3D print a replacement pipe used in chemical processing.



(b) Describe two ways a CFD test could be used to ensure the replacement pipe performs like the original. **2**

[Turn over

1. (continued)

Set-up requirements are needed to prepare a 3D model for printing.

(c) Describe four set-up requirements that are necessary to produce a successful 3D printed model. **4**

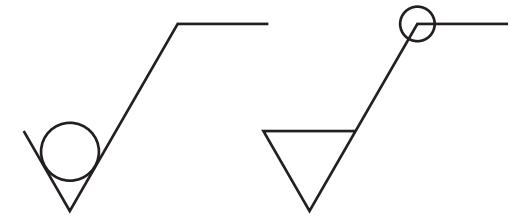
(d) Describe two ways of reducing the environmental impact of 3D printing.

Do not refer to energy efficiency or renewable energy sources in your response. **2**

1. (continued)

Technical graphics of the components are produced to British Standards and used for quality assurance purposes.

The component drawings provided include information on surface finishes.



SYMBOL A SYMBOL B

(e) Describe the different information symbols A and B provide for the model maker.

(i) Symbol A _____ **1**

_____

(ii) Symbol B _____ **1**

_____

[Turn over

DO NOT WRITE IN THIS MARGIN

2. Graphics for a new Scottish boutique hotel chain are shown below.

FRONT OF KEY CARD

BACK OF KEY CARD

FRONT OF BUSINESS CARD

BACK OF BUSINESS CARD

2. (continued) **MARKS** DO NOT WRITE IN THIS MARGIN

(a) Describe, giving two examples, how golden ratio has been used in the design of the key card. **2**

(b) Describe two ways each of the following have been used across the range of graphics: focal point, negative space and silhouettes.

(i) Focal point **2**

(ii) Negative space **2**

(iii) Silhouettes **2**

[Turn over

2. (continued)

(c) Explain, giving three reasons, why the company would protect the rights to the graphics produced for the hotel. **3**

FRONT OF BUSINESS CARD

BACK OF BUSINESS CARD

Refer to supplementary sheet 1 for use with question 2 (d).

(d) Explain why paper opacity and crop marks will be important in the success of the business card. **2**

[Turn over for next question

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2. (continued)

An interior designer is producing CAD models for the hotel rooms, as shown below.

(e) Name two computer-aided illustration techniques and describe how they would be used to enhance the CAD model of the room interior. **4**

Illustration technique 1 _____

Description _____

_____

_____

_____

Illustration technique 2 _____

Description _____

_____

_____

_____

2. (continued)

(f) Name two computer-aided lighting types and describe how they would be used to enhance the model of the room interior. **4**

Lighting type 1 _____

Description _____

_____

_____

_____

Lighting type 2 _____

Description _____

_____

_____

_____

[Turn over

3. A company has produced a new stop frame animation app aimed at young people.

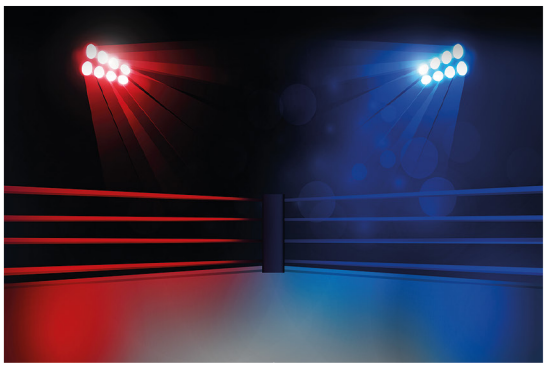
(a) Describe two advantages of stop frame animation for the user. **2**

(b) Describe two disadvantages of stop frame animation for the user. **2**

3. **(continued)**

Raster images are provided for use as animation backgrounds.






(c) Describe how resolution and colour space will affect the company's choice of raster images. **2**

[Turn over

3. (continued)

The company has used images from a stock library site.

(d) Describe two advantages and two disadvantages of using stock library sites. **4**

The company logo '#movbots' will be used on a range of print and digital based media.

(e) Explain, giving two reasons, why the .ai file type was used in the production of the logo. **2**

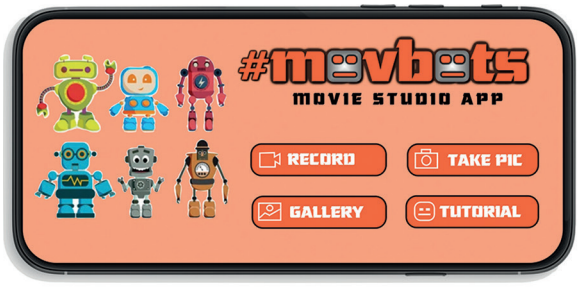
3. (continued)

(f) Describe two features of this logo that would be complex to reproduce using vector software. **2**

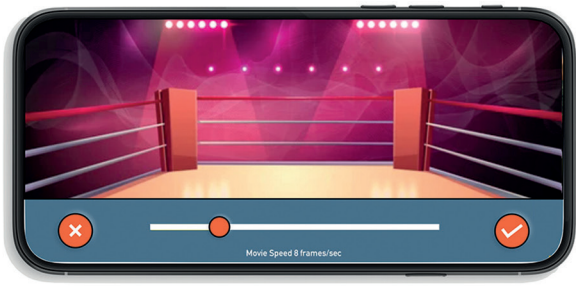
[Turn over

3. (continued)

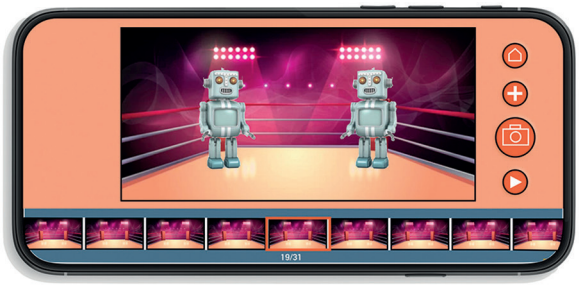
Screenshots from the app in use are shown below.



SCREEN 1



SCREEN 2



SCREEN 3

SCREEN 4

(g) Describe how contrast, white space, balance and shape make the app easy to use. **4**

4. A CAD model of a siphon coffee maker is shown below.

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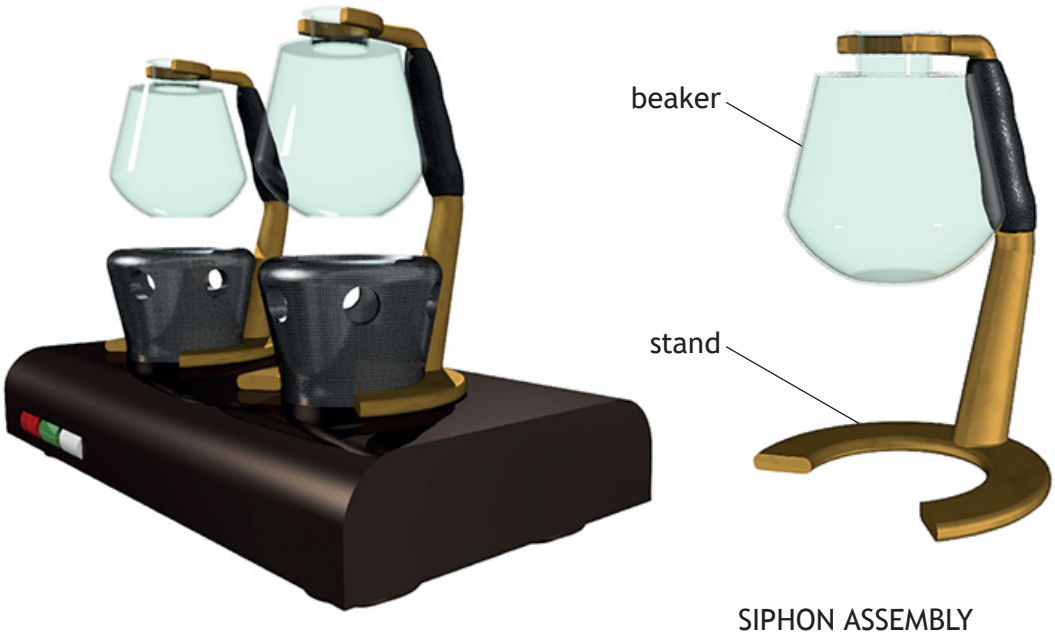

SIPHON ASSEMBLY

Refer to supplementary sheet 2 for use with question 4 (a).

The 'stand' was made using 3D CAD solid modelling techniques and the 'beaker' using 3D CAD surface modelling techniques.

(a) Describe the 3D CAD solid modelling techniques used to create the stand.

You may use sketches to support your answer. **7**

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4. (a) (continued)

[Turn over for next question

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4. (continued) **MARKS** DO NOT WRITE IN THIS MARGIN

The grip on the stand was created using morphing (freeform modelling) techniques.

Refer to stage 1 to 5 on supplementary sheet 3 for use with question 4 (b).

(b) Describe, using morphing (freeform modelling) techniques, how the grip was created. Stage 1 has been completed for you.

You may use sketches to support your answer. **4**

Stage 1	Offset the geometry of the top section of the stand and use this to create a new solid.
Stage 2	
Stage 3	
Stage 4	
Stage 5	

4. (continued)

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

Describe the 3D CAD surface modelling techniques used to create the beaker.

Refer to dimensions in your answer.

You may use sketches to support your answer. **6**

4. (continued)

To support customers assembling the coffee siphon, a motion tweening animation was created and saved as an .mpeg file type.

(d) Explain, giving two reasons, why the .mpeg file type was used for the animation. **2**

(e) Describe two advantages to the customer of using an animation rather than printed assembly instructions. **2**

4. (continued)

(f) Describe two methods of setting up the motion tweening animation, that will assist customers in assembling the coffee syphon. **2**

_____

_____

_____

_____

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[Turn over

5. A new extension is being proposed for a house, as shown on supplementary sheets 4a and 4b. **MARKS** DO NOT WRITE IN THIS MARGIN

Refer to supplementary sheets 4a and 4b for use with question 5 (a).

(a) Explain the role of four professionals in contributing to the success of the extension. For each professional you must make specific reference to features and annotations shown in the building drawings provided. Professionals could come from the built environment, manufacturing or engineering sectors. **8**

5. (continued)

Good planning is crucial to the success of the extension.

(b) Describe how a Gantt chart could be used to support the planning of the extension. **2**

[Turn over

6. A company specialises in the design and production of packaging for a range of products such as wireless ear buds.

Clients often request that the packaging is environmentally friendly and sustainable. The company is considering a move to solid ink systems for all printing.

(a) Explain, giving two reasons, why solid ink print systems will reduce impact on the environment. **2**

6. (continued)

(b) Describe, giving four examples, how the company can further reduce its environmental impact. You must not make reference to types of ink or recycled paper in your response. **4**

[END OF QUESTION PAPER]

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ADDITIONAL SPACE FOR ANSWERS

MARKS | DO NOT WRITE IN THIS MARGIN

ADDITIONAL SPACE FOR ANSWERS

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Question 2	Robcartorres/shutterstock.com
Question 2 (e)	Robert Kneschke/shutterstock.com
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