Candidate 1 evidence

MARKS

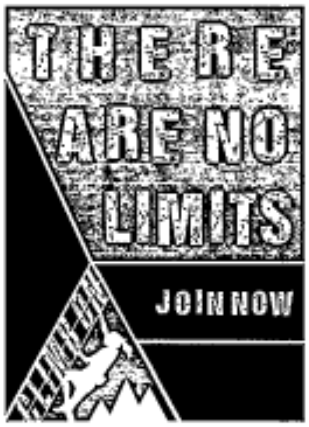
Total marks — 80

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

- creates a strong brand identity as customers are seeing the logo on each product they purchase/see.
- repitetion of the logo creates unity of each product, connecting them ~~to the~~ together as they all have similar designs.

1. (continued)

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

- the negative space on the logo has been used to create the ~~effect~~ illusion of the mountains (in bottom right corner).
- the entrance hall poster has used negative space to create the brown triangle to give the effect of the next mountain to climb.
- graphic 2 used negative space to emphasise the evolution of human over time.

[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. 6

- ensuring correct conversion of CMYK to RGB colour spaces. will ensure that the brands colours remain the same tone/ colour when being printed as CMYK is printed with 4 main colourspaces and RGB, only 3 (of differing colours to CMYK).
- converting text + fonts to a vector format ensures that when media is printed graphics can be resized with out losing resolution.
- dpi + PPi, ensuring that when printed dpi must be minimum 300dpi, and ~~when~~ for digital graphics, ppi must be above 75.

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

- first converting file to a vector format
- then add layers on top of image to transfer vector out line.
- using colour fill - select desired colour
  ↳ remove background layers

[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. 2

- as STL files describe the models design through mathematical geometry to 3D printers whilst STEP file just hold dimensions.
- STL files are the only compatable file for 3D printing.

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

Volume - ~~will determine the volumetric size of the model~~ - will show how much model is meant to hold printer will understand how strong the supports/walls have to be.

Centre of mass - printer will determine where to start off print, ensuring it doesn't topple over and prevent printing. making sure the COM is centred.

Model mass - printer will understand the scale of model to how much material is to be used, prevents print from stopping early or to late.

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 - has been used to provide a sence of time of day, gives an idea of sun positioning by casting a beam of light through an opening - creates a realistic setting as it shows where the most lit up parts of the house are situated.

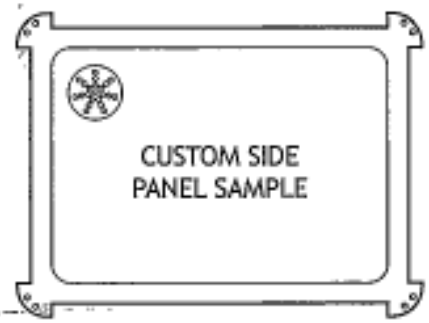
Bump mapping - used to create a sence of realism / realistic materials. - been used to create the illusion of cracks + bumps / shadows in the grass + wooden flooring using lighting tricks. - gives the viewer a sence of visual texture in the ~~peace~~ scene.

Image-based lighting (IBL) - has been used to create the sence of placement in an environment, gives the model an environment setting - also been used to show how natural light sources may be sheltered from the design due to the environments trees/bushes.

[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.



(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. 3

CAM

- SVG
- contains high levels of detail on demintions, ensures it will be cut accurately ★
- is a vector file type therefor will laser cut accurate lines ★
- wont be different to what is has been designed.

★ allowing it to fit securly into the other panel components.

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).** 2

- show which part of component requires finishing
- and also shows what type of finishing is necesary to the part.

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 45.99 mm

(ii) Maximum size 46.01 mm

[Turn over

0·25
0·5

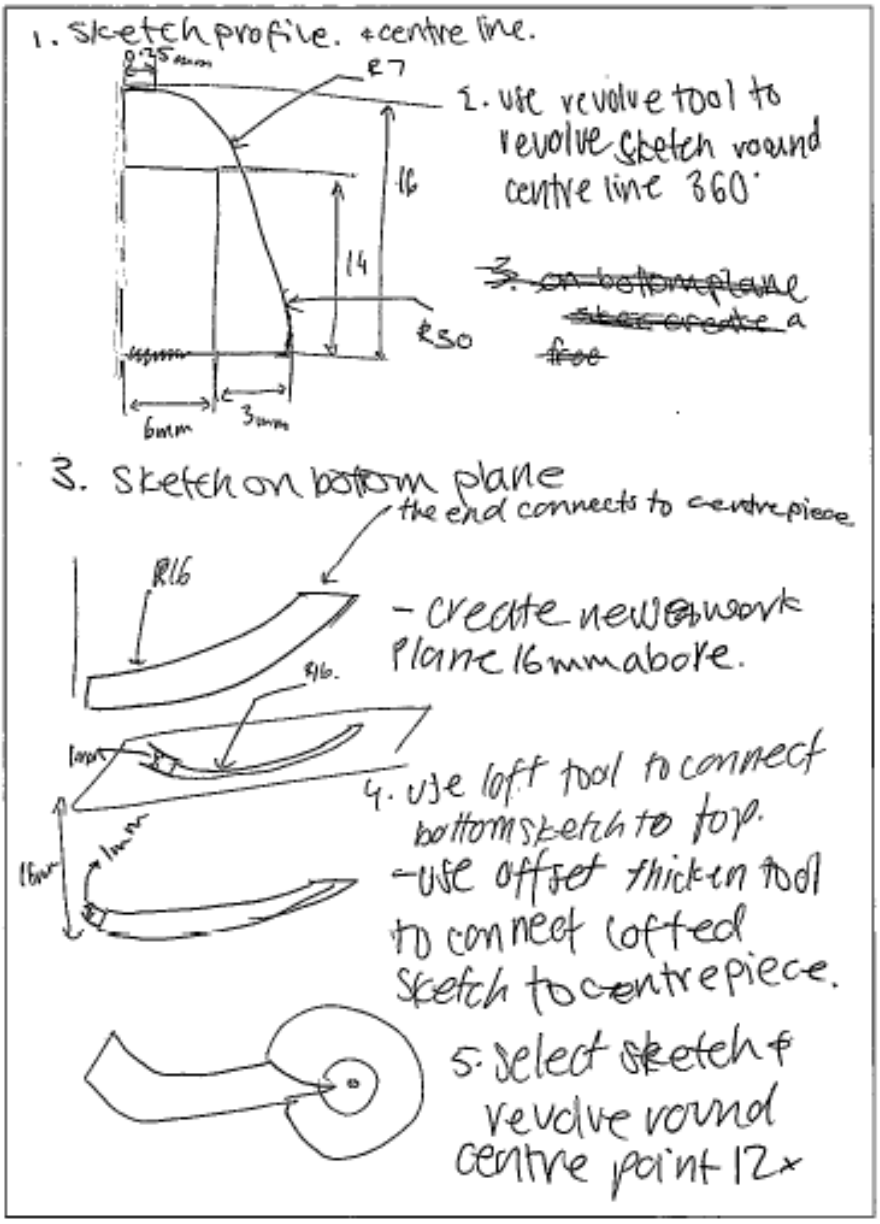
3. (continued)

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

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

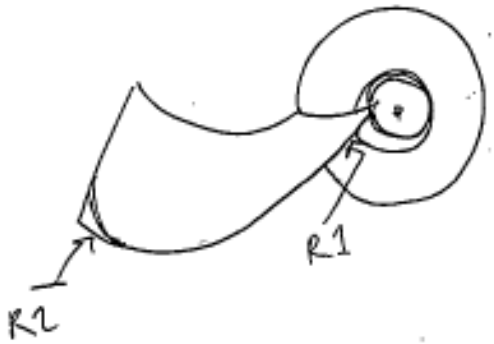
(d) Describe the 3D CAD modelling techniques used to create the fan blade component.

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



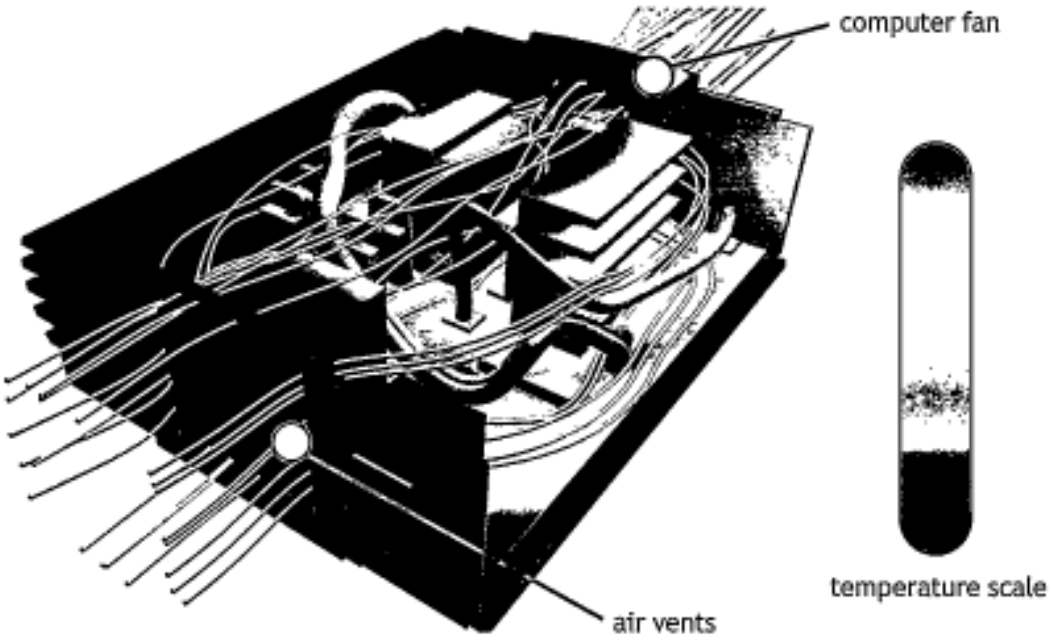
3. (d) (continued)

6. use irregular fillet to fillet corners 2m, 3m, 1m



3. (continued)

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



(e) Describe what changes might be made to the design as a result of this digital testing method. 2

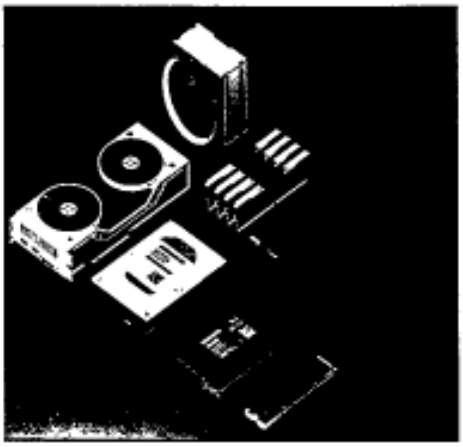
(less blades allows more air in)

- an increase in openings for air to access to prevent such heating & allow increased airflow
- the fan not beeing situated straight opposite the air vents, will prevent full circulation & flow to access the equipment.

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. 4

- in transit if weather effects packaging paper instructions may get ruin, therefore good for consumer as the instructions on the a video will always be there.
- consumers get a visual runthrough of someone else assembling so know if they are doing the correct thing or not.
- consumers can visually see exactly what parts are needed where and are not all in writing.
- advanced technology allows for languages to be changed online allow all consumers to understand when the printed may have just been english, also allows consumers to pause / play / skip forward in the video

3. (continued)

(g) Describe one advantage and one disadvantage for the consumer of using the mov file type for the animation. 2

- has a very high file size so can take time to access + down load + take up alot of storage.
- can use ~~keyboard~~ ~~command~~ features to pause, play + rewind ~~the~~ the video, allows consumer to understand fully how to assemble

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. 3

- ensuring a cmyk colour space is selected so the output is accurate to the colours selected, as printers print using cmyk systems.
- bleed areas are important so that graphics that are to extend off the page do so without leaving a white boarder all around.
- dpi is important to be over 300 dpi to ensure a legible, high resoluted, final print

[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 gm²
bleed 3 mm
CYMK colours

(b) Explain, with reference to the print specification extract, why offset lithography was chosen for the book sleeve. 3

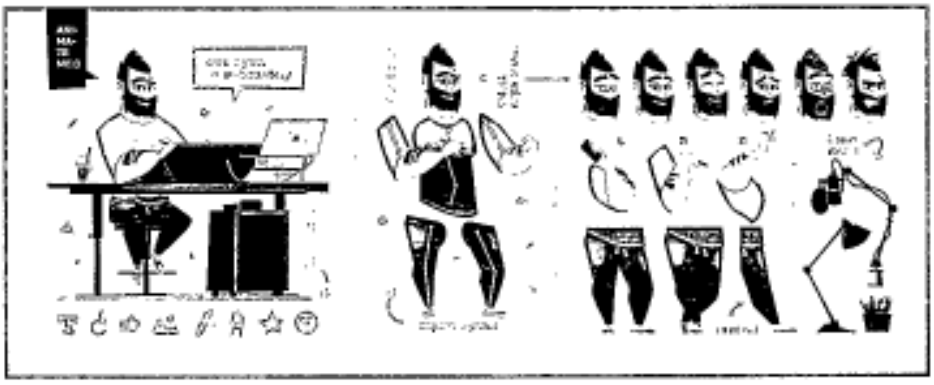
- offset lithography is the most common type of printing and is suitable for large print runs (of 20000 copies)
- offset also is suitable as it prints using cMyk ink rollers, so exact colours chosen will be printed.
- offset printing is suitable as it only prints on paper substrates (ideal for 140gm² textured paper).

(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. 3

- the printer used for final production was not used making it inaccurate of how it would actually print.
- images of glossy paper prints will affect the reflection, therefore overall look of the front page, can not see the real quality of print.
- ink jet printing is not suitable for long print runs, so quality will decrease majorly from the first printed to last therefore will not give an accurate representation.

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.



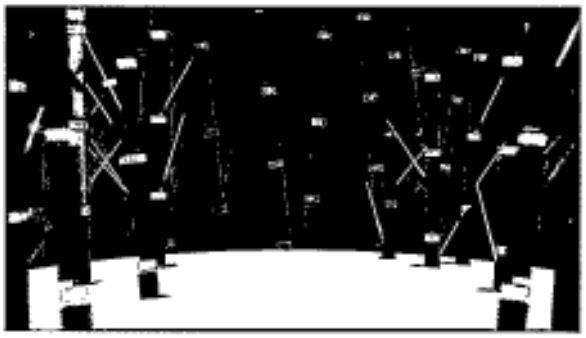
(a) Explain how motion capture and motion tweening could be used in the creation of the game. 4

- motion capture can be used to capture real-life movements from humans ~~etc~~ aswell as real facial features creating a realistic lifelike character.
- motion capture will allow you to capture movement of items to, creating realism of moving/ closing (laptop)/ phone!
- motion tweening can be used to save & reduce the time spent animating as only the first & last frame have to be created.
  ↳ computer generate inbetween frames.
- ~~eff~~ motion tweening allows creators to easily add in extra characters/items at different frames.

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

- AI files can be easily edited as its a vector file type allowing ~~des~~ quick changes if necesary.
- png file are very low in size will allow designer to send out to team, and easily download on to device

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: 3

1. dynamic effects
2. depth of field
3. rule of thirds.

1- ~~dynamic effect has Dee enhance the animation as all of the bamboo trunks are leading/pointing into~~

1- dynamic effect has enhanced the animation by having the bamboo all pointing inseperate directions creating a sence of realistic growth + dynamic movemer through the plants.

2- having foreground bamboo blurred out allows viewer to focus on the main element, the character, enhance animation as creates a focul point for viewer

last one on BACK PAGE!

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. 3

- using transitions to seemlessly switch from ~~page~~ one scene to another, will keep the user engaged as it doesn't take their eye off the screen.
- including a zoom in onto characters body will make game more engaging as it will create a dramatic atmosphere, warning them to keep playing.
- using a zoom out will also engage the viewer as they'll be able to see more of the characters environment, creating a focal point of the character in the middle of screen.

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. 2

- to analyse the soil composition under a proposed site to ensure it will be stable for buildings to build on
- to determine the depth of bedrock under a site, to determine whether a suitable height of foundations can be installed.

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.** 2

- will use the plan to determine where trees must be removed and where trees should be planted.
- will also make use of the contour information to determine how much excavation will be needed in the area they have to work in.

[Turn over

6. (b) (continued) MARKS

(ii) Describe how a quantity surveyor will use two pieces of information shown on **supplementary sheet 6.** 2

- will make use of the Exterior features + gardens list to calculate exactly what is needed and how many are needed + what it will cost
- will use the ~~measurements of the~~ number of houses on the map to calculate exact cost.

(iii) Describe how construction trades will use two pieces of information shown on **supplementary sheet 6.** 2

- will use the measurments of the seperate houses to show ~~the builders~~ the space they ~~need~~ have to build each house
- will use the info from the roads + paving list to ensure brick / paving layers create a flat usable road.

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. 4

- drainage ~~to survey~~ layer, will show buyers where their waste will go, if it will affect any of the housing, gives honest communication as a mains could be right under one house.
- a features layer so potential buyers can see what is in the outside areas i.e benches in the park area. will improve communication as it will make the location seem more family friendly

ADDITIONAL SPACE FOR ANSWERS

5 c) - having the ground take up the bottom ^1/3 of the screen allows the viewer attention to be drawn to the dominant 2/3rd (the green space) which holds the characters, it creates a balance & is easy on the viewers eye.

Candidate 2 evidence

MARKS | D W M

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

To maintain brand identity and ~~show customers that the~~ to promote the brand positively and professionally to customers

MARKS

1. (continued)

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

- In the logo, negative space is used to add ~~a~~ to add interest a mountain shape at the bottom. ~~for more~~
- On the coffee cup sleeve negative space is used to emphasise the logo
- The poster is seperated into segments similar to the pattern/texture of rocks, a texture is applied to one of the segments to further create this effect

[Turn over

MARKS | D W M

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. 6

- The graphics have a dpi of at least 300 to enable high quality printing.
- Any RGB values are converted to CMYK or have Pantone colours provided for matching
- Any text is converted to vectors to maintain quality when printed

MARKS

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

Import the image into a vector software and draw a path over the image to be filled ~~or use a raster software~~

[Turn over

MARKS | D W M

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. 2

STEP files are not readable by 3D printers, only STL as they store the correct informations

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

Volume Determines how much material should be used in the print

Centre of mass Makes sure the print is aligned and correctly prints the model

Model mass Determines how heavy the model should be in order for the print to work

MARKS

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 In the pools, you can see the volume of light produced by the underwater lights. There is also light shining through the trees on the grass to show how much shade the trees cast

Bump mapping ~~Can be seen on the curtains to show the~~ Used on the mosaic tiles in the pool to make them textured and also on the rocks to make them more realistic

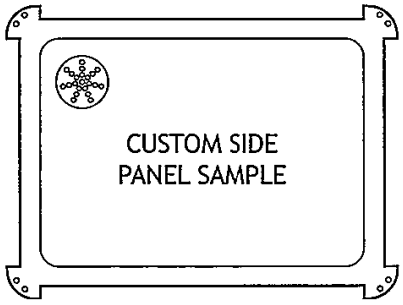
Image-based lighting (IBL) The environment reflects onto the building, for example, on the top part, the green of the tree is seen on the wall and reflected in the windows and on the water too

[Turn over

MARKS

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.



(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. 3

DFX files allow a 2D design to be stored and ~~used~~ read by a laser cutter

MARKS | D W M

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).** 2

Used to show what surface finish the casing should have and the ~~tolerance~~ thickness

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 47.85

(ii) Maximum size 48.1

[Turn over

MARKS

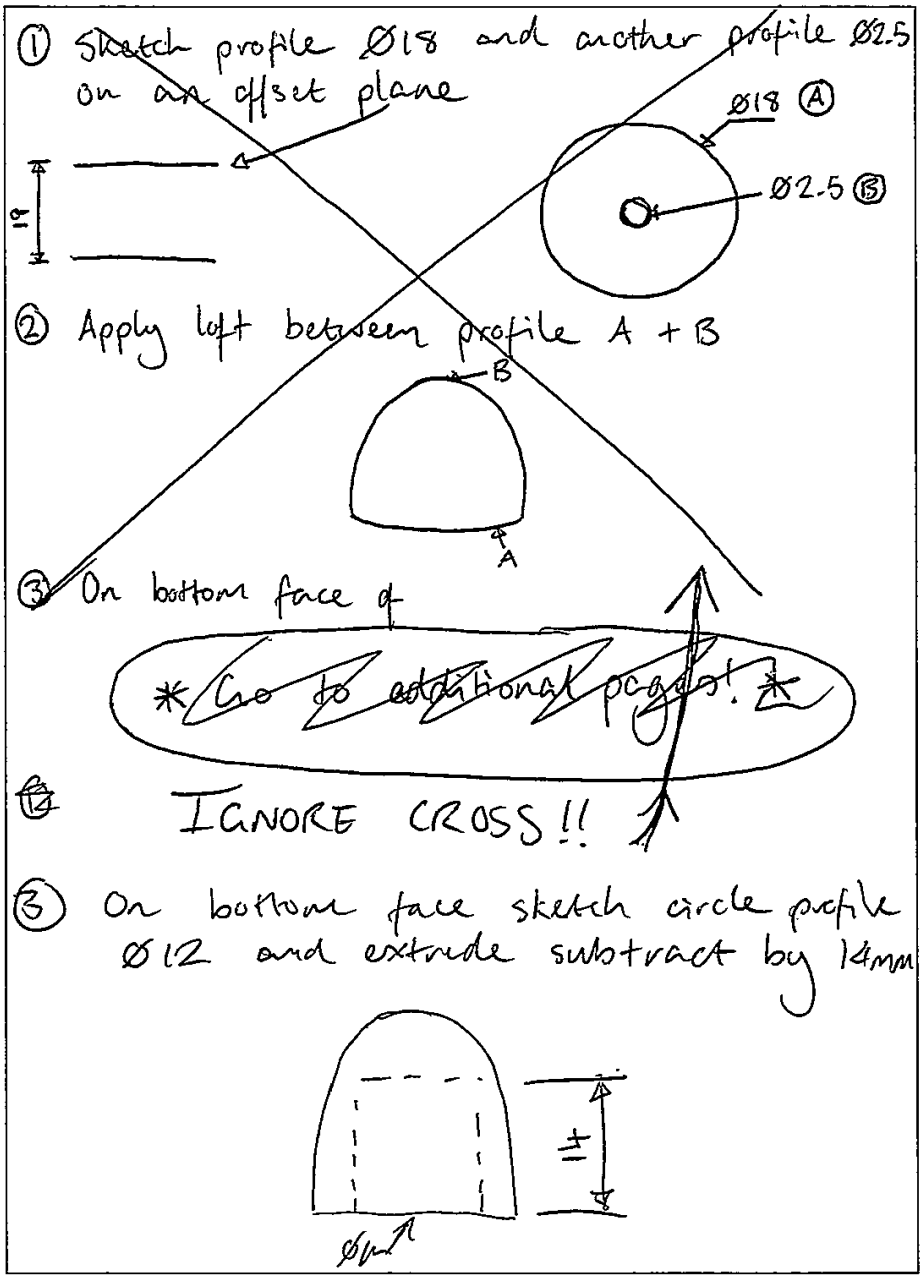
3. (continued)

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

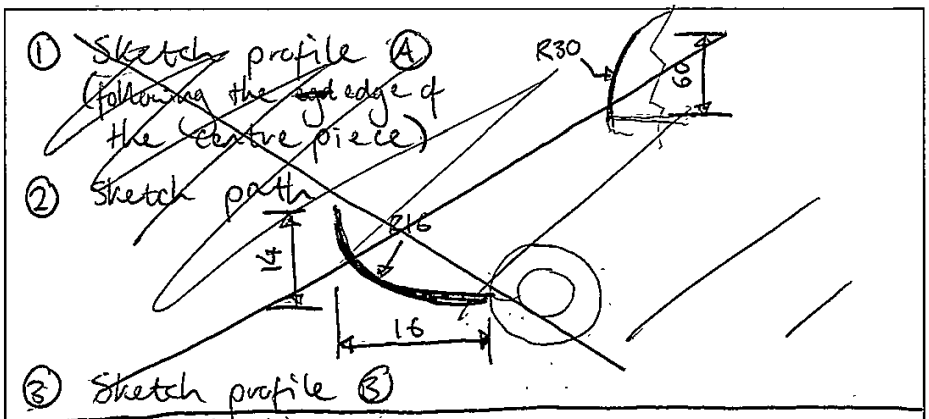
Refer to **supplementary sheet 4 for use with question 3 (d).**

(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

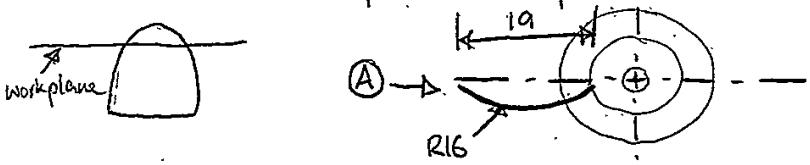


3. (d) (continued)

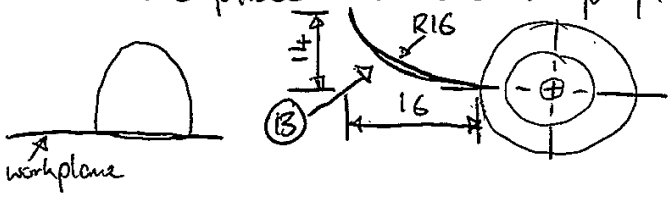


Fan Blade

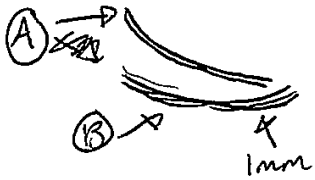
① Sketch profile (A) on workplane 16mm from bottom of centre piece.



② ~~&~~ Create workplane aligned with bottom of centre piece and sketch profile (B)



③ ~~Offset both profiles~~ Create lines offset from both profiles (A) + (B) with a thickness of 1mm and connect each to form closed shapes



continued in additional pages

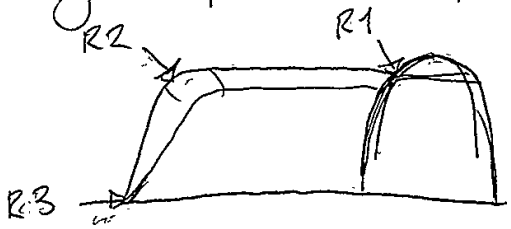
MARKS | DO WR MA

ADDITIONAL SPACE FOR ANSWERS

3d) (continued)

④ Apply loft between profile Ⓐ + Ⓑ

⑤ Apply irregular fillet to top edge of blade

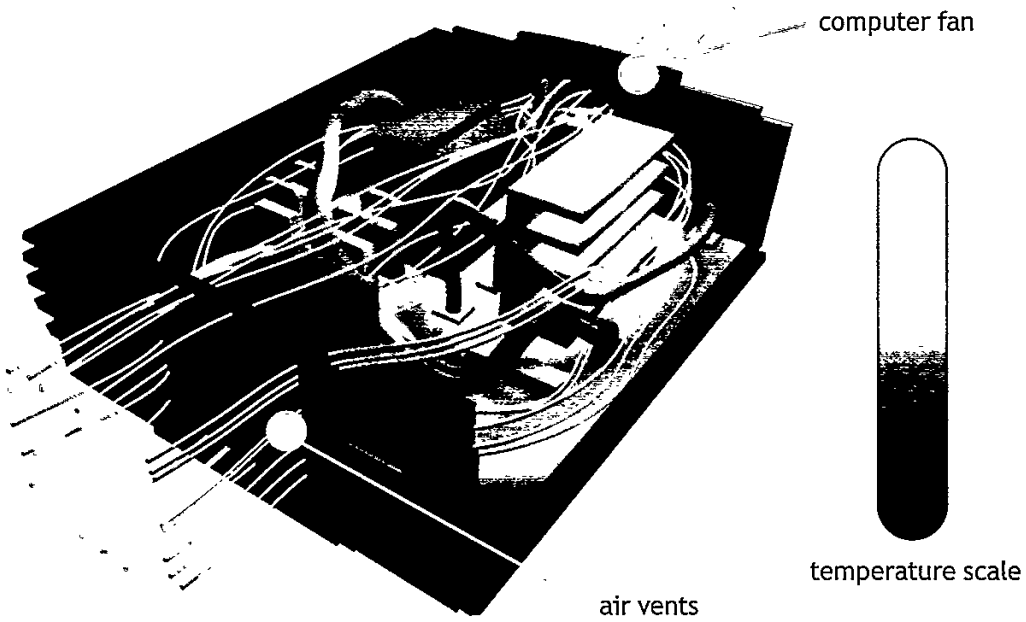


⑥ Repeat blade around centre piece 12 times (circular array)

MARKS | D W M

3. (continued)

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



(e) Describe what changes might be made to the design as a result of this digital testing method. 2

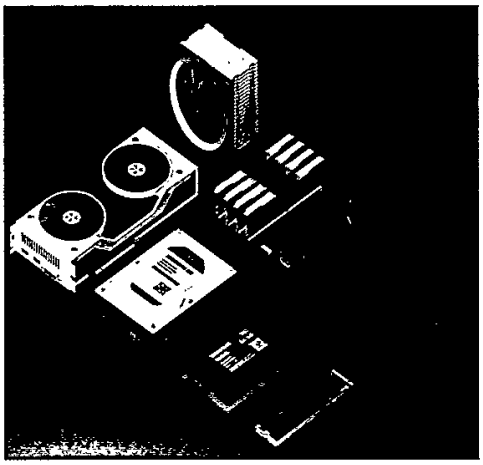
Changes might be made to change air flow to ensure that parts that are too hot get cooled ~~but~~ but also continues to be distributed around the entire casing as well

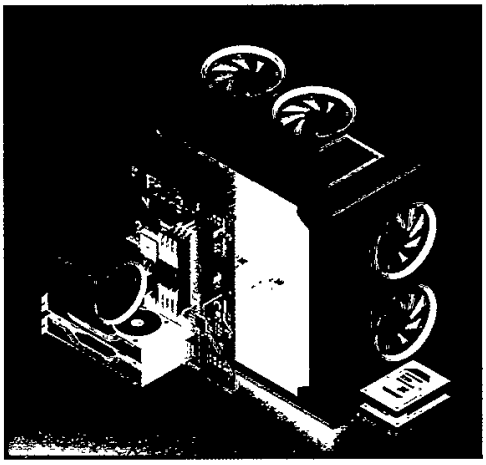
MARKS | DO NOT WRITE IN THIS MARGIN

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. 4

- Animations can be used to show the consumer where ~~an~~ and how a component is fitted more clearly
- ~~A voice over can be added~~ The video may zoom into parts to make it easier for the consumer to see
- Consumers can easily understand the video, especially if they speak another language
- The video has more realistic representations of the parts which helps to figure out what they are.

MARKS | DO WR T MA

3. (continued)

(g) Describe one advantage and one disadvantage for the consumer of using the mov file type for the animation. 2

It can have a large file size but is high quality and compatible with most devices

MARKS

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. 3

- Colour space ensures that the printed colours match the desired colours
- Bleed area makes sure that when the sleeve is trimmed, it will have the correct layout and the elements will extend to the edge
- DPI is important as it ensures that the print is of a high quality ~~and~~. the higher the dpi, the better the final print will be. ~~It should~~

[Turn over

MARKS | D W N

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. 3

It was the most appropiate for printing a large amount ~~of prints~~ and could print on textured paper. It was also the most efficient ~~in to~~ as the book sleeves are ~~small~~ not that big.

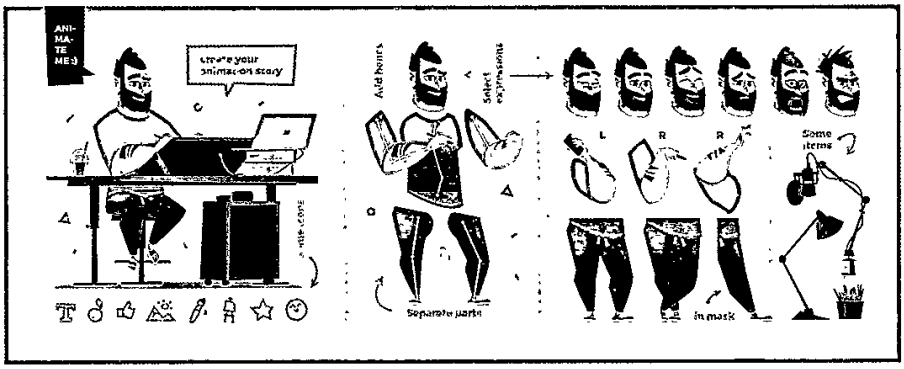
(c) The client was posted a screenshot of the book sleeve, printed on glossy paper using an ink-jet printer.

Explain why this is of limited value in assessing the quality of the print. 3

It isn't the physical print, so you can't tell ~~the~~ how the actual thing will look + feel like. The colours may also be less vibrant or different from the final as it uses a different printer. The paper type is also different as it is glossy and not textured

MARKS | DO WRI TH MAR

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. 4

Motion capture can create realistic movements easily and show how the character interacts with objects. It could be used for facial expressions aswell. Motion tweening could also be used for more basic animations where there is minimal movement or for the icons which do not need to move realistically.

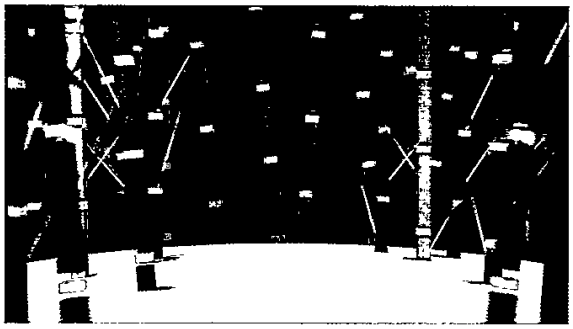
[Turn over

MARKS

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

- ai ~~is the~~ can be edited only in Adobe illustrator and has all the original information ~~has~~ stored (layers, colours, objects etc)
- png lets the designers export images without backgrounds and of high quality

MARKS

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: 3

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

- Dynamic effects have been used to enhance the sense of movement in the animation and make the character more alive
- Depth of field is ~~also~~ used to make the character feel part of the scene and also focuses on it by blurring the foreground
- In the 1st and 3rd screenshots, the character is positioned in the first third to provide white space around it and for the background

MARKS | D W M

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. **3**

- Transitions could be added for more engaging effects
- Text could be added to guide users or to highlight something
- Parts could be slowed or sped up to create certain effects or to tell a story

MARKS

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. 2

To show the soil composition and determine ~~if~~ how deep foundations need to be. It can also show if the land had any previous uses

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.** 2

- Existing trees can help determine what needs to be planted / removed
- The contour lines help with planning ~~how~~ where there are slopes

[Turn over

6. (b) (continued) MARKS

(ii) Describe how a quantity surveyor will use two pieces of information shown on **supplementary sheet 6.** 2

- The details of using turf and artificial grass in areas determines the cost
- Materials for certain parts (eg. play area) also help determine cost

(iii) Describe how construction trades will use two pieces of information shown on **supplementary sheet 6.** 2

- Information on ~~what~~ how the ~~pavement~~ road will be constructed ~~and~~ to plan what is needed
- Materials help to determine what they need and how much (can be figured out from location plan)

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. 4

- Add colours to houses that correspond to the ones used in the bottom right corner to help identify them
- Add a key that shows what some of the more technical symbols mean

[END OF QUESTION PAPER]

MARKS | DO NOT WRITE IN THIS MARGIN

ADDITIONAL SPACE FOR ANSWERS

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Question 5 (b) tykcartoon/shutterstock.com