Design & Technology
A-Level

Computer Aided Design
Multiple Choice

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- Use a cross in the box to mark you answer 

Advice

- Marks for each question are in brackets
- Read each question fully
- Try to answer every question
- Don’t spend too much time on one question

Good luck!

Q1. CAD stands for?

A Computing and design ☐

B Computer-aided diagram ☐

C Computer-aided design ☐

Q2. CAM stands for?

A Computer-aided manufacture ☐

B Computer aided making ☐

C Computer aided modelling ☐

Q3. What is prototype?

A A scaled-down model of a product ☐

B A non-working model of the product ☐

C A working model of a product made to Test before production ☐

Q4. What is 3d printing a type of?

A Computer-aided manufacture ☐

B Computer aided design ☐

C isometric drawing ☐

Q5. A schematic diagram is made up of what?

A Vanishing points ☐

B Symbols ☐

C Perspectives ☐

Q6. What is a vanishing point?

A A coordinate in CAM ☐

B A point on the horizon where all lines meet ☐

C A symbol on a circuit diagram ☐

Q7. Which of the following is the process called etching?

A A prcoess whereby paint is sprayed onto the Surface of a material ☐

B A process that creates a long-lasting protective Coating on a metal ☐

C Acid is used to remove the unprotected surface Of a metal for a decorative finish ☐

Q8. Which one of the following processes involves dipping a metal into molten zinc?

A Galvanising ☐

B Cathodic protection ☐

C Electroplating ☐

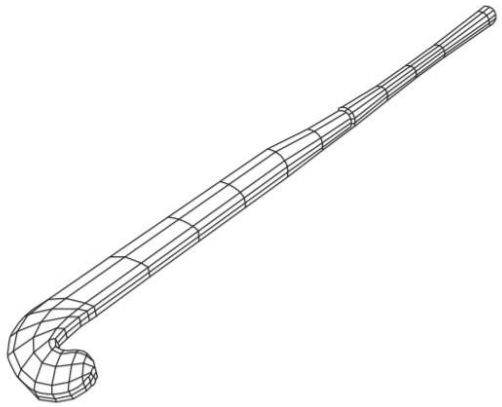
Q9. Three dimensional (3D) drawings communicate information in different ways to two dimensional (2D) drawings.

Describe two advantages 3D drawing has over 2D drawing. **(4 marks)**

Advantage 1:

Advantage 2:

Q10. The image below shows a virtual model of a new hockey stick.



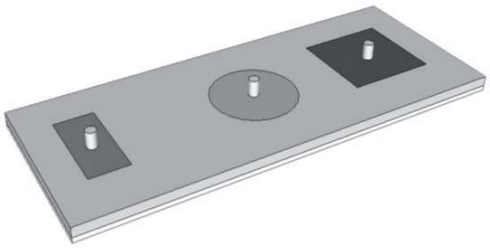
Explain 2 reasons for creating a virtual model of a new hockey stick **(4 marks)**

1.

2.

Q11. Discuss the advantages and disadvantages of using CAD for virtual modelling and testing designs **(6 marks)**

Q12. A childs wooden puzzle is shown below.



12. Describe 2 ways in which the manufacturer is able to use email in its business **(4 marks)**

1.

2.

Q13. Describe 2 advantages of virtually modelling and testing the final design using CAD before starting manufacture **(4 marks)**

1.

2.

Answers

Q1. C
Q2. A
Q3. C
Q4. A
Q5. B
Q6. B
Q7. A
Q8. B

Q9.

A maximum of 2 marks for each advantage
One mark for each correct advantage with a second mark awarded where response is clarified/ additional detail is provided
Indicative content:
This question is about drawing and about Cad.

1 mark responses:

- You can see at least 3 sides of the object drawn
- Drawing is more realistic
- Create an artist's impression of an object

2 mark responses:

- 3D drawing provides a more realistic view of how the drawn product might look in real life
- 3D drawing gives the viewer opportunity to imagine how the drawn product might feel when held/used
- 3D drawing can be used to create a perspective view of an object, eg 1, 2 or 3-point perspective
- Can be used to show how a product can be assembled, eg exploded drawings
- Makes it easier to understand how to assemble flat pack furniture as you can see how the different parts/components relate to each other.
- You can see at least 3 sides providing detail of sizes and proportion

Q10.

Any two reasons explained from:

• Products can be viewed / seen all round / 3D / see what it looks like / coloured / textures added (1) therefore a true and accurate representation can be gained from the computer model (1)

• Designs can be edited / modified / viewed all round on screen without having to redraw / physically modelled (1) which saves time / materials / speeds up any development (1)

• Files can be sent electronically via email (1) which saves time / reduces costs / speeds up the whole design and make process (1)

• Files can be output to 3D printing / rapid prototyping machines (1) which enables real models to be produced to test / hold / evaluated (1)

• Computer simulations such as stress / strain tests can be carried out (1) which will allow the designer to see if the hockey stick will be able to withstand the forces / impacts it will be subjected to when playing (1)

2 x 1

2 x 1

Q11.

Indicative content

Discussion to address the following issues:

Advantages

- Can test weights/destructive testing
- Can simulate production times
- Calculate material costs
- Files can be transferred electronically
- Ideas easily edited/amended
- Library of standard components/stock size materials
- Anthropometrics/Ergonomic data accessed via databases
- Can be output to 3D printing
- Can view design from all angles
- Colours and textures can be changed easily
- Easily dimensioned for cutting lists
- No need to purchase modelling materials
- Reduced demand on resistant / compliant materials for modelling

Disadvantages

- High cost/expensive set up
- Highly skilled operative required / training issues
- Power-cuts can lose work/loss of files if not backed up
- Unable to physically test until prototype is produced

- Continual development/upgrade of software/hardware required
- Potential threat of hacking / cyber theft / ransom

(Cap marks at a maximum of 4 if candidates
only present advantages or disadvantages
and not both)

Q12.

Two ways described from:

• They are able to communicate (1) with designers / manufacturers / other retailers/ suppliers (1)

• It is cheaper for them to do a bulk mail shot via email (1) in comparison with normal post costs (1)

• It is quicker (1) which means they can send their information out faster than normal post/ internal departments (1)

• They are able to attach documents / order forms / special offers/ advertise (1) which means that they can target their mailing more specifically (1)

• They can send data files / spread sheets (1) to their accountant / do tax files (1)

• They can send CAD files (1) to manufactures in order to make prototypes / get prices (1)

• Internal communications (1) maintains/ keeps record of discussions/ requests/ decisions (1)

2 x 1

2 x 1

Q13.

Two advantages described from:

• Products can be coloured/textured (1) to show what they will look like in real life/viewed from all angles (1)

• Designs can be changed easily (1) without having to redraw the whole thing (1)

• Files can be sent electronically via email (1) which saves time and money (1)

• Electronic files can be linked to CAM machines (1) so that prototypes/models can be manufactured (1)

• Performance modelling can be carried out (1) to test to destruction/see how strong/safe it is (1)

• Reduce costs/saves money (1) as products do not need to be made for testing (1)

• Material dimensions / properties can be changed (1) to identify the areas where less / more material may be needed (1)

• All aspects are correct (1) before committing money which would be wasted if there were errors (1)

• Customer feedback can be gathered (1) to see if it would sell/market research (1)
• To see if individual pieces fit together (1) will reduce waste/materials/save time before manufacturing
2 x 1
2 x 1