Design & Technology
A-Level

Computer Aided Manufacture
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 design ☐

C Computer-aided diagram ☐

Q2. CAM stands for?

A Computer aided modelling ☐

B Computer aided making ☐

C Computer-aided manufacture ☐

Q3. What are the advantages of automation?

A Less waste produced and faster running time ☐

B Low set up cost ☐

C Lots of jobs are created ☐

Q4. What one of these is an example of CAM?

A Designing on a computer ☐

B Band saw ☐

C 3D printing ☐

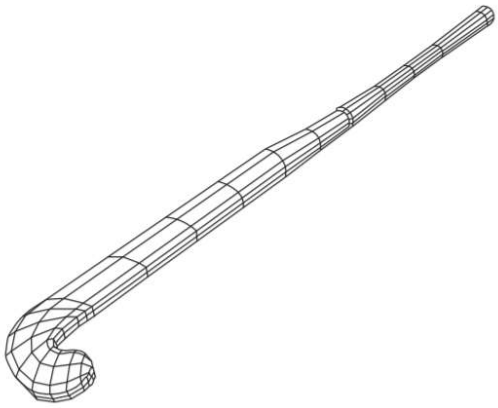
Q5. Which of the following statements about 3d printing is True?

A	Good for mass production	☐
B	Fast printing speed	☐
C	Prints are high quality	☐

Q6. Which of the following is not a CAD software?

A	Excel	☐
B	Google sketchup	☐
C	Techsoft 2d design	☐

Q7. 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.

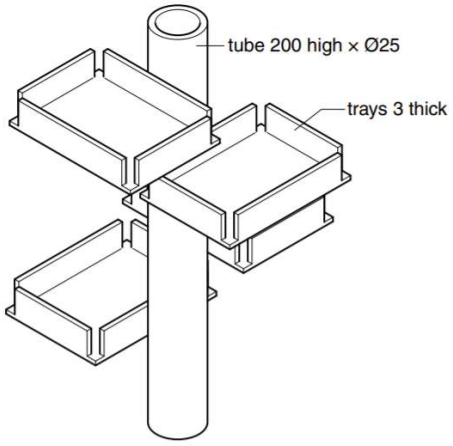
Q8. Discuss the advantages and disadvantages of using CAM for manufacture of products **(6 marks)**

Q9. Describe 2 advantages of laser cutting **(4 marks)**

1.

2.

Q10. The figure below shows an incomplete design for a desk tidy made from acrylic



Describe how CAM could be used to cut out the shape of the trays **(3 marks)**

Answers

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

Q7.
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

Q8.
Indicative content
Discussion to address the following issues:
Advantages

- Can be output to 3D printing
- Creates products that are identical to each other
- Drawings can easily be repeated for new batches
- Enables very high accuracy levels in large-scale production
- Usually speeds up production of low-volume products

Disadvantages

- High cost/expensive set up

- Highly skilled operative required / training issues
- Power-cuts can stop work
- Machinery can be expensive and time consuming to repair
- Continual development/upgrade of software/hardware required

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

Q9.

Two advantages described from:

- The file/program is created once (1) and can be used over and over again / easily repeated / no marking out required (1)
- Once tested and set up (1) there is no need for human intervention / human error / reduced labour costs (1)
- The machine can run 24/7 (1) which means greater output / efficiency (1)
- It is very accurate/every component will be the same size (1) which means rejects will be fewer / fewer mistakes / less material wasted / parts will fit / identical parts (1)
- Great detail can be achieved (1) which means complex shapes can be achieved (1)
- Little edge finishing is required (1) which means production time / secondary processing is reduced (1)
- Text/pictures (1) can be engraved onto the surface by adjusting laser power (1)
- Clean edges produced (1) leaves no sharp / jagged edges (1)
- Quick / fast process (1) so many items can be cut in a short amount of time (1)
- Identical components cut (1) because it is computer numerically controlled CNC machine (1)
- Adaptable process / power easily adjusted so it can cut different materials (1)

Do not accept CAD related answers

2 x 1

2 x 1

Q10.

Accept any three stages in the CAM production process:

- select type of CNC machine used
- design drawings transferred or downloaded to CNC machine
- setting up of acrylic workpiece
- setting of machine parameters

[3 × 1 mark]