

Design & Technology
AQA A-Level

Computer aided manufacture (CAM)

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
- For the multiple choice questions, circle your 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. Which CAM process uses a focused beam of light to cut materials like acrylic or wood?

- A** Milling
- B** Laser cutting
- C** Turning

Q2. Routing in CAM is best suited for:

- A** Carving grooves in wood or plastic sheets
- B** Shaping metal gears
- C** Welding electronic components

Q3. What does CNC milling use to remove material?

- A** High-pressure water jets
- B** Rotary cutting tools
- C** Plasma torches

Q4. Turning is primarily used to create:

- A** Flat sheet-metal designs
- B** Cylindrical parts like bolts or pipes
- C** 3D-printed prototypes

Q6. The product shown in below has been laser cut and joined with solvent cement. Evaluate the suitability of the manufacturing method for this product (6 marks)



Answers

Q1. B

Q2. A

Q3. B

Q4. B

Q5.

Digital printed image

- Full colour digital images or photographs can be printed on to a substrate before application allowing for corporate logos and pictures to be featured.
- Large format prints can be created and scaled for a variety of sized vehicles.
- One large self-adhesive feature is easier to apply and ensure that it is square and in line with the vehicle panel.
- Digital printing requires costly machinery which can make the process prohibitive for smaller companies.
- Digital printing has limited UV resistance so may fade quickly and lose its visual impact.

Plotter cut vinyl

- A limited range of colours are available so it may not be possible to match a company's branding.
- Only simple text, numbers and simple graphics are really viable to produce.
- Individual cut letters and numbers are more prone to coming unstuck than a large digital print.
- The coloured vinyl has good resistance to UV maintaining a vivid colour for longer.
- Plotter cutters are fairly affordable and can be run off simple often free software
- Cut vinyl letters are cheaper than a digitally printed equivalent and are therefore more flexible for advertising special events or price changes etc.
- Plotter cut images are vector based and therefore can be scaled without loss of resolution/quality.

Q6.

- Each component could be accurately cut out to an accurate tolerance using a laser cutter, providing flat, smooth surfaces to then be joined.
- The laser cutting process would provide a reliable, repeatable manufacturing process.
- The design can be fairly well tessellated to reduce the volume of material used although waste will be created.
- Laser cutting the design would be appropriate for small flexible production runs.
- The shape provides ample surface area for joining with a solvent cement.
- The shape of the component means that no gluing jigs would be necessary.
- The writing on the component can easily be engraved using the laser cutter.