

Design & Technology

AQA A-Level

Major developments in technology

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. How has microelectronics influenced modern product design?

- A** Increased the size of electronic devices
- B** Reduced reliance on digital components
- C** Enabled smaller, more connected devices with IoT integration

Q2. What is a key benefit of using new materials like graphene or composites in manufacturing?

- A** Enhanced sustainability and material performance
- B** Higher production costs with minimal gains
- C** Simplified traditional manufacturing processes

Q3. Which manufacturing method allows for rapid prototyping and customized production?

- A** Handcrafting
- B** Injection moulding
- C** 3D printing

Q4. How have advancements in CAD/CAM impacted product development?

- A** Slowed the design process due to software complexity
- B** Accelerated prototyping and improved precision
- C** Limited creativity by standardizing designs

Q5. Discuss the issues associated with the development of electric vehicles **(6 marks)**

Answers

Q1. C

Q2. A

Q3. C

Q4. B

Q5.

- Hazardous substances used in battery development
- Environmental concerns with extraction of materials for battery development (rare earth elements)
- Reference to the use of fossil fuels in the production of electric vehicles.
 - Electric cars are prohibitively expensive in comparison to petrol and diesel alternatives
- Diminishing oil supplies and raising costs are encouraging some consumers to convert to electric vehicles.
- Increasing costs of diesel and petrol may encourage consumers to consider electric alternatives
- Range of a single charge can be a concern.
- Current charging infrastructure is not sufficient
- High temperatures (in the sun) can degrade the battery.
- Customer concerns re: ongoing maintenance costs such as replacement batteries/disposal of batteries
- Development of electric vehicles is a huge cost for car companies.
- Emissions from electric vehicles during use and environmental factors are a huge benefit for electric vehicles.
- Government targets for no new petrol or diesel car sales after 2030 are driving developments and investment in infrastructure.