**Design & Technology**

**AQA A-Level** Logo

Description automatically generated with low confidence

**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.