**Design & Technology**

**AQA GCSE** Logo

Description automatically generated with low confidence

**How materials are cut shaped and formed to a tolerance**

**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.** What is a tolerance in manufacturing?

**A** The colour of a finished product

**B** The acceptable range between minimum and maximum measurements

**C** The type of material used

**Q2.** Why are tolerances important in mass production?

**A** They make every product unique

**B** They ensure parts fit together correctly and maintain quality standards

**C** They reduce the need for measurements

**Q3.** If a dimension is given as 50mm ± 0.5mm, what is the maximum acceptable size?

**A** 49mm

**B** 51mm

**C** 50.5mm

**Q4.** Which tool is most suitable for checking tolerances precisely?

**A** A ruler

**B** A saw

**C** A vernier caliper

**Q5.** Explain how tolerances are used to control quality when making a prototype. Give two examples of how incorrect tolerances could cause problems. **(4 marks)**

**Answers**

**Q1**. B

**Q2**. B

**Q3**. C

**Q4**. C

**Q5**.

**Example Answer (4 marks):**

1. **Purpose of tolerances (1 mark):** Tolerances define the allowable variation in measurements to ensure parts fit and function correctly.
2. **Quality control (1 mark):** During prototyping, tolerances help identify errors early, reducing waste and ensuring consistency.
3. **Problem 1 (1 mark):** If a drilled hole is **too small** (below minimum tolerance), a bolt won’t fit, making assembly impossible.
4. **Problem 2 (1 mark):** If a component is **too large** (above maximum tolerance), it might not fit into other parts, causing structural weakness.