**Design & Technology**

**AQA A-Level** Logo

Description automatically generated with low confidence

**Jigs and fixtures**

**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 the primary purpose of a jig in manufacturing?

**A** To hold materials in place during assembly

**B** To guide tools for accurate, repeatable operations

**C** To decorate finished products

**Q2.** How do fixtures differ from jigs?

**A** Fixtures include cutting tools, while jigs do not

**B** Fixtures are only used for welding

**C** Fixtures hold workpieces in place but do not guide tools

**Q3.** Which process would most likely use a drilling jig?

**A** Creating identical holes in several components

**B** Painting multiple parts the same colour

**C** Sanding curved surfaces

**Q4.** What is a key advantage of using jigs and fixtures in mass production?

**A** Ensuring consistency across all products

**B** Reducing the need for skilled workers

**C** Lowering material costs

**Q5.** A manufacturer uses a jig when welding a bike frame together. Explain two reasons why a jig would be used **(4 marks)**

**Q6.** Describe two ways that a jig can be used to improve accuracy in manufacture **(4 marks)**

**Answers**

**Q1**. B

**Q2**. C

**Q3**. A

**Q4**. A

**Q5**.

* Jigs can be used to hold components in place while joining/fabrication is undertaken reducing labour costs.
* Jigs can be used to guide tools during fabrication reducing errors from slippage.
* Jigs remove the risk of components moving during fabrication, this reduces errors and improves quality control.
* Jigs increase speed of repeating a process as they aid simple line up of components.
* Jigs increase accuracy of repeat components as they remove some of the need for measurements.

**Q6**.

* A jig improves accuracy by removing the need for measuring and marking out to take place each time a cut is made or a hole drilled. This removes the potential for human error throughout the marking out process.
* A jig can improve the accuracy of manufacturing a particular joint, by securely holding the workpiece while also guiding the cutting tool, eg when cutting a mitre joint in timber or when drilling a hole.
* A jig can be used to ensure consistency when manufacturing a product, eg guiding a router around a particular profile ensuring consistency and accuracy where two kitchen worksurfaces may join.