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Design & Technology
AQA A-Level

Planning for accuracy and efficiency

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. Why is it important to plan for accuracy when making prototypes?

A It allows the designer to skip testing

B It ensures parts fit and function as intended before final production

C It guarantees a product is mass-produced

Q2. What is a benefit of using jigs or templates when making a prototype?

A They reduce energy use

B They allow completely random outcomes

C They improve repeatability and consistency

Q3. Which production scale requires the **most automation** and highest level of efficiency?

A One-off production

B Batch production

C Mass production

Q4. What should a designer consider when planning a process for batch production?

A Flexibility to adjust between batches

B Avoiding the use of any measuring tools

C Relying on manual guesswork

Q5. A turned metal component is to be manufactured on a manual lathe. Outline the information required to ensure it is accurately made **(6 marks)**

Answers

Q1. B
Q2. C
Q3. C
Q4. A

Q5.

- Reference to the type of metal required.
- The stock form/size of material that the component is to be turned from.
- The cutting speeds for each operation within the production must be specified to guarantee the surface finish required.
- Dimensional drawing must be supplied to allow accurate production.
- Dimensional tolerances must be given for quality control.
- Use of go no-go gauge/templates to test for sizes.
- The specific tooling to be used for each operation must be specified, eg if the end is to be knurled, thread tool for cutting the thread, parting tool to finish/cut the piece off.
- Details of lubrication, any reference to appropriate lubricant would be credited.
- Feed rates must be specified.
- Flow diagram to show sequence of operations.
- Machine maintenance records Reference to safe working practices and PPE should not be credited as they are not directly related to accuracy.