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Design & Technology
AQA A-Level

Disassembly

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 goal of designing for disassembly?

A To make products harder to repair

B To simplify recycling and component reuse

C To increase manufacturing complexity

Q2. How do smart materials (e.g., SMA) aid active disassembly?

A They change shape with heat/light to release components

B They dissolve in water

C They require manual triggering with tools

Q3. Why use biodegradable parts in product design?

A To reduce landfill waste via natural decomposition

B To increase product weight

C To make disassembly more difficult

Q4. What is a drawback of active disassembly systems?

A Increased manual labor

B Limited to metal-only products

C Higher material/technology costs

Q5. Explain how the inclusion of smart materials in electronic products aids the end-of-life disassembly **(4 marks)**

Answers

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

Q5.

- Shape memory polymers (SMP) and shape memory alloys (SMA) are starting to be used to replace traditional polymer fixings.
- Active disassembly at the end of a product's life reduces the amount of human interaction needed at this phase of the product lifecycle.
- At the end of the product's useful life the product may be heated or exposed to an electric current. These stimuli cause a change in shape of the fixing or fastening.
- The reduction in size of the fixing or fastening or the adjustment in shape of a cantilever clip etc would allow for the fixing to become loose.
- The contraction of the SMA or SMP component would enable either partial or complete removal of the joint.
- The product may be vibrated to help separate the device into component parts.