**Design & Technology**

**AQA A-Level** Logo

Description automatically generated with low confidence

**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.