Design & Technology
(Product Design)

DTBase©

OCR A-Level

Extending Product Lifecycles Through Sustainability (3.2b)

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. Which of the following best describes the purpose of designing for maintenance?

A To make the product disposable after first use

B To allow easy cleaning, part replacement, and upkeep

C To prevent users from accessing internal components

Q2. Which design approach most strongly supports *closed-loop* recycling systems?

A Using multiple bonded materials to increase structural rigidity

B Selecting mono-materials and clearly marking polymer types

C Prioritising aesthetic finishes that conceal material identity

Q3. A product is designed to allow firmware upgrades over its lifespan. This strategy primarily combats which negative lifecycle issue?

A Functional obsolescence

B Material degradation

C Loss of recyclability at end-of-life

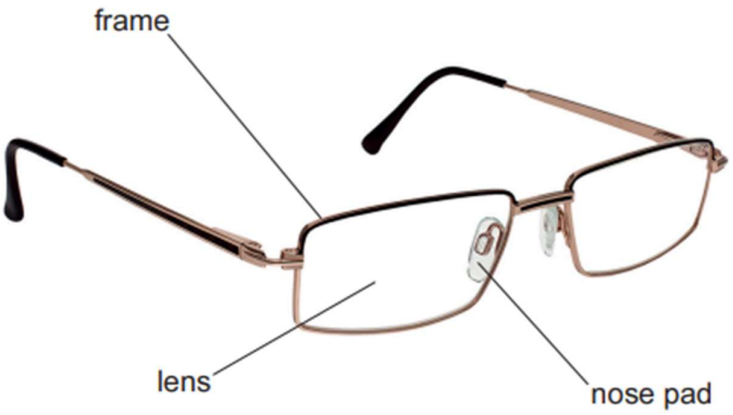
Q4. Which scenario best reflects *remanufacture* rather than repair?

A A cracked casing is replaced while the rest of the product remains unchanged

B Components are cleaned, worn parts replaced, firmware updated, and the product is restored to “as new” performance

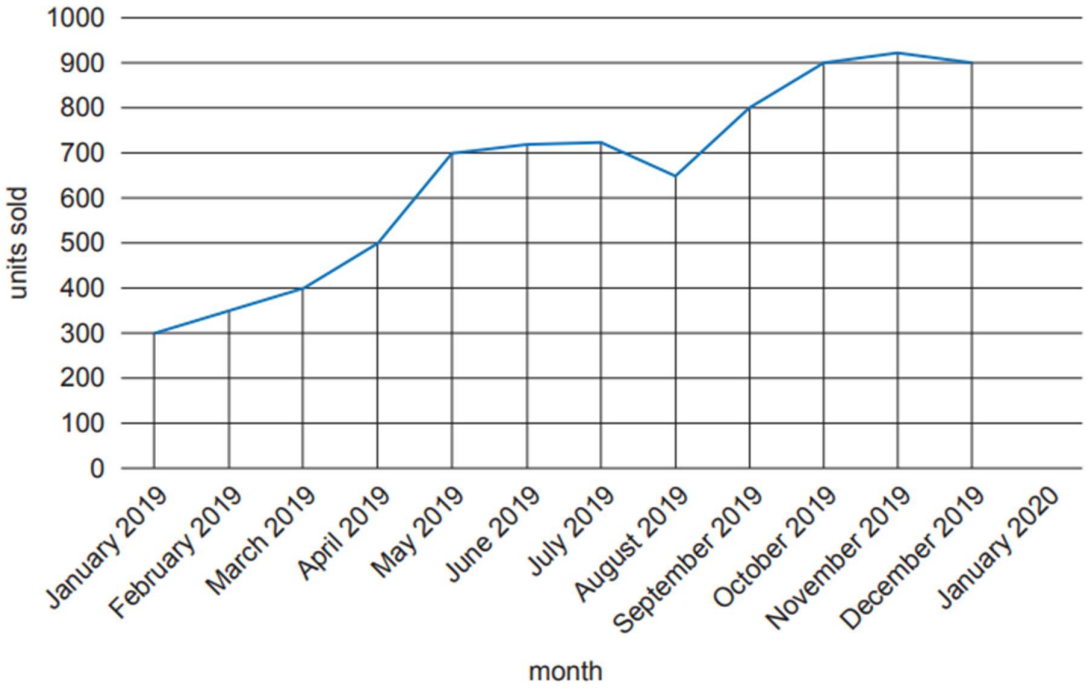
C A user installs a new software patch to fix a security issue

Q5. The image below shoes a pair of glasses



Explain three ways that the useful life of the glasses could be extended. **(6 marks)**

Q6. The graph below shows sales of a product over a year.



Q6a. Identify and explain the stages of the product's lifecycle from January 2019 to August 2019. **(4 marks)**

Q6b. State two possible reasons for the change in the number of units sold from August 2019 to October 2019. **(2 marks)**

Answers

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

Q5.
Possible explanations may include:

- The glasses could be designed to be upgraded (1) with removable parts that could be changed to follow changes in fashion or prescriptions (1). • The glasses could be designed with interchangeable parts (1) so that they can grow with the user (1).
- The glasses could be recycled (1) and manufactured into other products (1).
- The glasses could use standardised components (1) so that when a part breaks, it can be easily sourced and replaced (1).

Any other valid suggestion to include the reinforcing of specific parts e.g. arms or lenses or changing materials of specific parts to extend the life of the glasses can be credited.

Q6a.
Possible responses may include:

- From January to May the product was in a 'growth stage'/ the product had just been launched and sales were increasing (1) as a result of the walkie-talkie becoming more popular (1).
- From May through to August the product was in a 'maturity stage'/ sales levelled out/reduced (1) as a result of a factors such as market saturation/another walkie-talkie being introduced to the market (1).
- Any other valid suggestion.

Q6b.
Possible reasons may include:

- An increase in marketing through social media or use of an influencer may have seen a large number of sales (1).
- The price point of the product may have decreased (1).
- A new colour of walkie-talkie may have been introduced to attract a wider audience (1).

- A heightened need may have been created by a specific security incident/change I legislation (1).
- Any other valid suggestion.