

Design & Technology
AQA A-Level

Critical analysis and evaluation

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 critically analysing a personal or commercial product?

- A** To increase manufacturing cost
- B** To identify potential improvements or modifications
- C** To create an exact copy of another design

Q2. Which of the following is an example of modifying a product based on evaluation?

- A** Painting a prototype a different colour
- B** Replacing a non-adjustable hinge with a flexible one after user testing
- C** Naming the product after a commercial brand

Q3. Why is it useful to compare a personal design to an existing commercial product?

- A** To ensure the design is identical
- B** To highlight potential legal issues
- C** To identify strengths and weaknesses for improvement

Q4. Which of the following is a common disadvantage of evaluating one's own product?

- A** Designers may struggle to remain objective
- B** It always results in a worse design
- C** It eliminates all user feedback

Q5. The image below shows a water pump used in an isolated village



Feature	Description
Power	Hand-operated mechanical pump
Fabrication	Standardised nuts and bolts
Material	Low-carbon steel sheet
Design	Open-sourced
Finish	Galvanising

Analyse and evaluate the suitability of the water pump design for this isolated village **(6 marks)**

Q6. The image below shows two wheelbarrows.



	Wheelbarrow 1	Wheelbarrow 2
Wheel	Rotationally moulded hollow spherical HDPE tyre	Low carbon steel hub with rubber tyre
Bucket	Injection moulded HDPE	Press formed powder coated low carbon steel
Frame	Powder coated low carbon steel	Powder coated low carbon steel

Compare the suitability of the two wheelbarrows shown for use on a building site **(6 marks)**

Answers

Q1. B

Q2. B

Q3. C

Q4. A

Q5.

- Use of standardised fixings makes repair easy.
- Hand operated means no reliance on power which may not be available or may be intermittent.
- Low cost components make theft unattractive meaning more likely to remain in working condition.
- Open-sourced design is free which makes the product accessible to all.
- Temporary fabrication methods meaning maintenance can be performed by locals without investment in specialist tools.
- Operation is intuitive and doesn't require instructions or training.
- Galvanised finish will protect the pump from corrosion without chipping. Sheet steel may become too hot to comfortably touch/use in a hot climate.

Q6.

- The spherical tyre allows Wheelbarrow 1 to steer more easily without tipping over.
- A spherical tyre increases surface contact with the ground meaning Wheelbarrow 1 will not sink into soft ground as easily as Wheelbarrow 2.
- The spherical tyre may be harder to replace as it is not as common as the tyre for Wheelbarrow 2.
- The HDPE bucket in Wheelbarrow 1 is less likely to damage objects such as wooden door frames when driven into them unlike the Low Carbon Steel bucket in Wheelbarrow 2.
- The HDPE bucket can be left outside without the risk of corrosion.
- The HDPE bucket may be prone to UV degradation leading to cracking and discolouration. The HDPE bucket is self-finishing meaning scratches are less visible.
- Wheelbarrow 2 coating is likely to chip when being used with cement/aggregate etc.
- Wheelbarrow 1 can be used with wet cement etc without risk of degradation.

- Any reference to colour pigments must be justified related to the context.