



National
Qualifications
2021 ASSESSMENT RESOURCE

X819/77/11

Design and Manufacture

Duration — 2 hours 15 minutes

Total marks — 65

SECTION 1 — 15 marks

Candidates should attempt EITHER question 1 OR question 2.

SECTION 2 — 50 marks

Attempt ALL questions

Write your answers clearly in the answer booklet provided. In the answer booklet you must clearly identify the question number you are attempting.

Use **blue** or **black** ink.

Before leaving the examination room you must give your answer booklet to the Invigilator; if you do not, you may lose all the marks for this paper.



* X 8 1 9 7 7 1 1 *

SECTION 1 — 15 marks

Candidates should attempt EITHER question 1 OR question 2

1. During your course you will have analysed the manufacture of a commercial product(s).
Identify a commercial product(s) you have analysed.
- (a) Discuss the effectiveness of the aesthetics of the product(s). 4
- (b) Discuss the suitability of the materials and processes used to manufacture the product(s). 4
- (c) Discuss the suitability of the assembly methods of the product(s). 4
- (d) Discuss whether consideration for the environment influenced the design of the product(s). 3

OR

2. During your course you will have researched the evolution of a commercial product(s).
Identify a commercial product(s) you have researched.
- (a) Describe how the evolution of the product(s) was influenced by advances in materials and manufacturing processes. 6
- (b) Describe how the evolution of the product(s) was influenced by **two** of the following
- safety
 - global events
 - a designer
 - legislation. 6
- Products will continue to evolve.
- (c) Describe possible future developments in the product(s) you researched and explain why they are likely to happen. 3

SECTION 2 — 50 marks

Attempt ALL questions

3. Products such as the bikes shown below can be manufactured using a range of materials and processes.



Bike A



Bike B

- (a) Describe the issues a manufacturer would consider when selecting suitable processes and materials for products such as the bikes. 6

Production and planning systems are used to make the manufacturing process as efficient as possible.

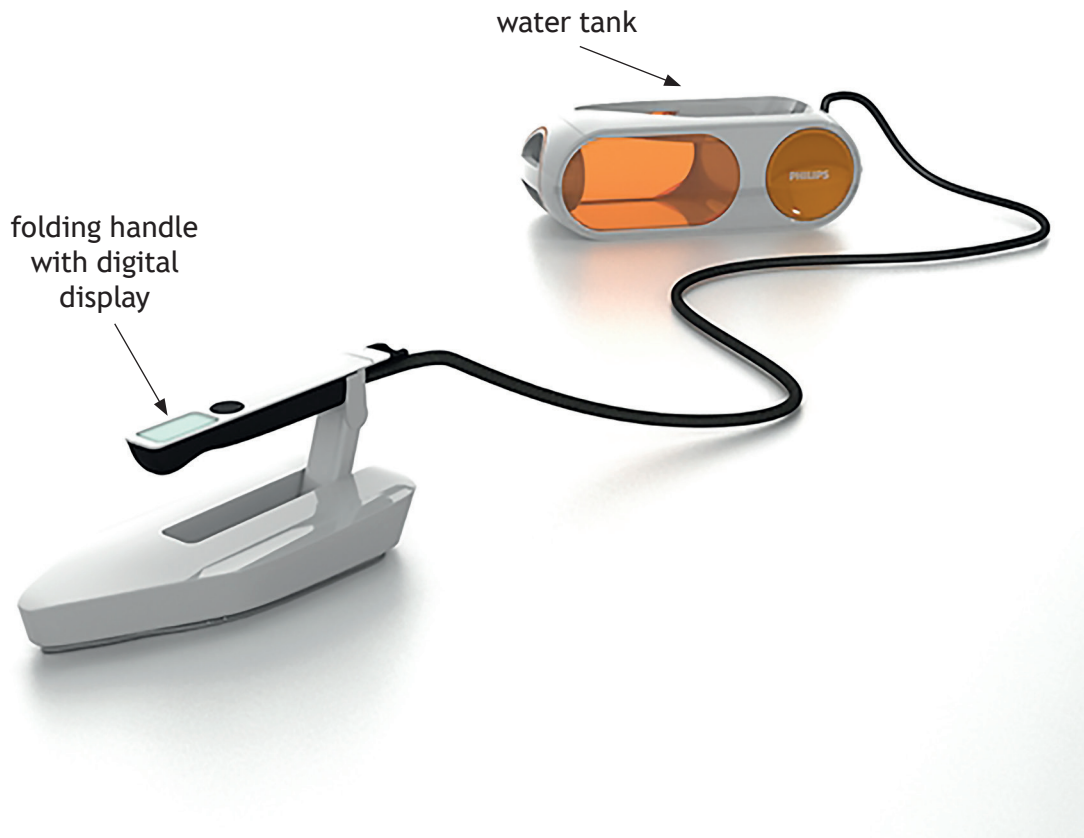
- (b) Identify ways in which a manufacturer could improve the efficiency of manufacturing products such as the bikes **and** explain their benefits. 5

Part of Bike A was injection moulded. Careful consideration was given to the position of injection and ejector points in the design of the mould.

- (c) Explain what influences the placement of the injection and ejector points in moulds. 2

[Turn over

4. A concept design for a steam iron for Philips is shown below.



Launching a new product can be a risk for a company.

(a) Explain why launching a new product can be a risk. 4

A company can use various methods to protect their intellectual property rights (IPR).

(b) Identify a suitable method that could protect the IPR of the steam iron and outline its key features. 3

Product recalls can be very damaging to a company if not handled properly.

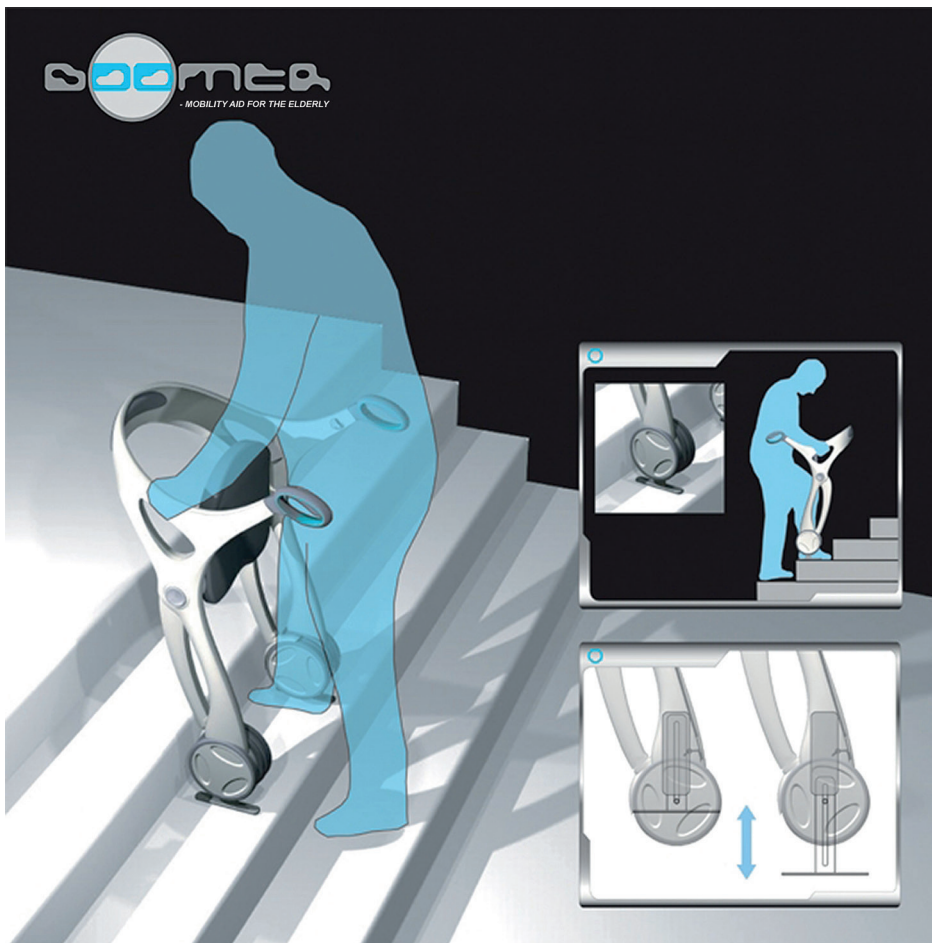
(c) Describe the steps a company could take to minimise the negative impact of a product recall. 3

Product recalls can be avoided if there is a good quality assurance system in place.

(d) Describe the steps a manufacturer could take to maintain a high level of quality assurance. 4

5. The Boomer, designed by Daniel Molloy, provides mobility assistance for elderly people.

MARKS



Designers often have to carry out research to help them design products with which they are unfamiliar.

- (a) Describe a research strategy that may have been carried out to draw up a specification for the Boomer. Your answer should include
- methods of gathering information
 - who would be consulted.

6

Designers use a wide range of modelling techniques to develop a product.

- (b) Describe how modelling could have been used to develop the Boomer.

4

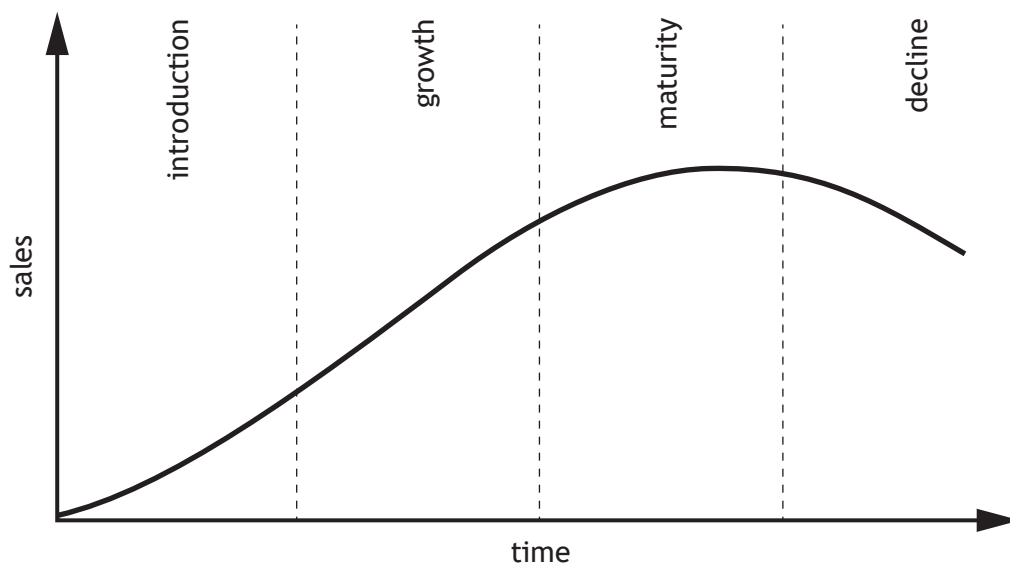
Ergonomics influenced the design of the Boomer.

- (c) Identify ergonomic issues which are likely to have been considered during the development of the Boomer and describe how they may have influenced the design.

4

[Turn over for next question

6. The graph below shows the sales of a product at different stages of its life cycle.



- (a) Describe the relationship between the stage of the life cycle and the profitability of the product. 2
- (b) Outline reasons the sales of a product may decline. 2
- (c) Outline ways a company can extend the maturity stage and maintain the sales of a product. 2

Planned obsolescence may be considered by manufacturers when developing products.

- (d) Describe the impact planned obsolescence has on the manufacturer, consumer and the environment. 3

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