



National
Qualifications
SPECIMEN ONLY

SQ10/H/01

Design and Manufacture

Date — Not applicable

Duration — 2 hours

Total marks — 70

SECTION 1 — 25 marks

Attempt ALL questions.

SECTION 2 — 45 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.



* S Q 1 0 H 0 1 *

SECTION 1 – 25 marks

Attempt ALL questions

1. Two bread bins are shown with product information.



Armadillo bread bin

Materials

- Base – beech
- Lid sections – aluminium
- Handles, hinges and slide guides – ABS

Retail price – £89.99



Joseph Joseph Bread bin

Materials

- Body – melamine
- Lid – beech

Retail price – £50.00

Question 1 (continued)

- (a) Explain why the materials chosen for each of these products are suitable. You should make **six** valid points. You do not need to cover all materials but should cover both products in your answer. **6**
- (b) Name **three** appropriate mass manufacturing processes used in the production of these bread bins **and** explain why they are suitable. You should cover both products in your answer but may refer to different processes for each. **6**
- (c) Describe the aesthetic appeal of each bread bin. Your answer should cover **four** different aesthetic aspects. **4**
- (d) Describe **five** functional issues that will have influenced the design of each of these products. **5**
- (e) Explain how any **four** production and planning systems can be used to improve production efficiency. **4**

SECTION 2 – 45 marks

Attempt ALL questions

1. The body of the paper punch shown below is made from mild steel sheet and has been manufactured by piercing and blanking.



- (a) Explain **two** advantages of piercing and blanking the body. 2
- (b) Explain **two** reasons for using carbon steel for the cutting blades. 2
- (c) Describe how the design of this product has been influenced by anthropometrics and physiology. 3
2. A golf trolley is shown below. The golf bag and clubs are carried on the trolley for ease of transportation when playing golf.



The designer was given an open brief for this product.

- (a) Describe **one** advantage and **one** disadvantage of an open brief. 2
- (b) Explain in what ways the designer would make use of any **three** pieces of research information when designing the golf trolley. 3
- (c) Describe **two** different ways in which user trials could be used to evaluate the function of the golf trolley. 2

3. The opportunity for new products can arise from technology push or market pull.
- (a) Describe how **two** aspects of the design of a product with which you are familiar has been influenced by:
- (i) technology push 2
 - (ii) market pull. 2

Many popular products are branded.

- (b) Explain **two** benefits of branding products for each of the following:
- (i) the manufacturer 2
 - (ii) the consumer. 2

4. A bicycle is shown below.



Pinarello cycle



Detail of carbon-fibre seat post

A number of different prototypes were used during the development of the bicycle.

- (a) Describe **three** ways in which prototypes could be used to gather specific information during the bicycle's development. 3

Computer technologies were used during the development of the bicycle.

- (b) Explain **two** benefits of using each of the following computer technologies in the development of the bicycle.
- (i) CAD 2
- (ii) Rapid prototyping 2

During the development of the bicycle the designer would have worked with a number of specialists within the design team.

- (c) Describe **two** aspects of the role of each of the following specialists in the development of the bicycle.
- (i) Market researcher 2
- (ii) Materials technologist 2

Standard components were used in the manufacture of the bicycle.

- (d) Describe **two** benefits of using standard components. 2

The bicycle seat post was made from carbon-fibre which is a composite material.

- (e) Describe **two** benefits of using composite materials. 2

5. Product design teams have a shared responsibility to design for sustainable development in order to protect the environment.

Explain how consideration for the environment has impacted on the design and manufacture of products with which you are familiar.

8

[END OF SPECIMEN QUESTION PAPER]

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