



National  
Qualifications  
2015

**X719/76/11**

**Design and Manufacture**

MONDAY, 25 MAY

1:00 PM – 3:00 PM

**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.



\* X 7 1 9 7 6 1 1 \*

## SECTION 1 – 25 marks

Attempt ALL questions

1. Two wheelbarrows for domestic use are shown with product information.

**Wheeleasey collapsible wheelbarrow****Materials**

- Tubular mild steel frame
- UV-protected waterproof cloth
- Nylon wheel
- Rubber, pneumatic tyre

Assembly required

Retail price – £99.00

**Endurance wheelbarrow****Materials**

- Galvanised mild steel tray and struts
- Tubular mild steel frame
- Polypropylene handles
- Nylon wheel
- Rubber, pneumatic tyre

Retail price – £55.00

- (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 wheelbarrows **and** explain why they are suitable. 6
- (c) Describe how physiology and psychology have influenced the design of the wheelbarrows. 4
- (d) Describe **five** functional needs that will have influenced the design of these wheelbarrows. 5
- (e) Explain the benefits for the manufacturer of using standard components in the production process. 4

## SECTION 2 – 45 marks

Attempt ALL questions

2. A lounge chair and footstool are shown.



Parts of the chair and footstool are made from laminated wood.

- (a) Explain **three** benefits of using laminated wood for these parts. 3

The base of the chair was manufactured in aluminium using the process of die casting.

- (b) Explain **two** reasons why die-casting was used to manufacture the base. 2

Many different processes were carried out during the manufacture of this product.

- (c) Explain how production and planning systems could be used to ensure the efficient manufacture of the product. 3

[Turn over

3. A play seat for children is shown.



The play seat was manufactured using the process of rotational moulding.

(a) Explain **three** benefits of using rotational moulding to make the play seat. 3

(b) Select a suitable plastic that could be used for the play seat and give **two** reasons for your choice. 3

Products designed for children need to comply with strict safety guidelines.

(c) Describe **two** safety issues that would need to be considered during the design of the play seat. 2

Many manufacturers try to ensure that their products are environmentally friendly.

(d) Describe the methods that manufacturers could use to minimise the negative impact of their products on the environment. 4

4. The DeWalt site radio charger shown is designed for use by professional builders. It can also be used for charging power tool batteries.



- (a) Describe how the needs of the target market have influenced the design of the site radio charger. 3

Anthropometrics is an important factor in the design of the site radio charger.

- (b) Explain how anthropometrics has been considered in the design of the site radio charger. 2

- (c) Describe a method the designer could use to evaluate the fitness for purpose of the site radio charger.

DeWalt has a strong brand image. 2

- (d) Explain two benefits of a strong brand image. 2

[Turn over for Questions 5 and 6 on Page six

5. A game from a well-known toy manufacturer is shown below.



Market research was carried out on the target market before the brief for the game was finalised.

- (a) Describe **two** methods that could be used to gather market research information for the game. 2

The toy manufacturer employed an external designer to produce concept ideas.

- (b) Explain **one** advantage and **one** disadvantage of using an external designer. 2

The external designer used idea generation techniques to develop initial ideas for the game.

- (c) Describe **two** idea generation techniques that could be used.  
(You may use sketches/diagrams to illustrate your answer.) 4

6. Designers frequently consider aesthetics as an important factor in the development of new products.

Explain how aspects of aesthetics have influenced the design of products that you are familiar with.

- (You may refer to more than one product in your answer.) 8

[END OF QUESTION PAPER]

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## ACKNOWLEDGEMENTS

Question 1 (Top image) – Image of “Trueshopping folding lightweight wheelbarrow” is taken from <http://trueshopping.co.uk>. Reproduced by kind permission of Trueshopping Ltd.

Question 1 (Bottom image) – Image of Wheelbarrow.

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Question 2 – Image of Lounge Chair designed by Charles and Ray Eames, 1956. Reproduced by kind permission of Eames Office. © Vitra.

Question 3 – Images of Child’s Play Seat.

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