

X211/701

NATIONAL
QUALIFICATIONS
2007

TUESDAY, 22 MAY
1.00 PM – 4.00 PM

PRODUCT DESIGN
ADVANCED HIGHER

100 marks are allocated to this paper.

Where appropriate you may use sketches to illustrate your answer.

For question 7, answer either 7(a) **or** 7(b).

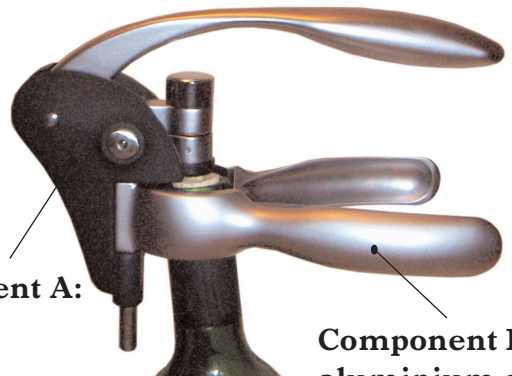


Attempt ALL questions.

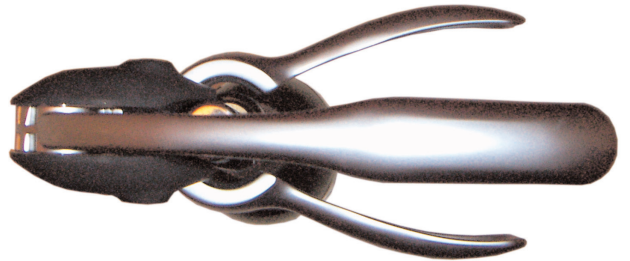
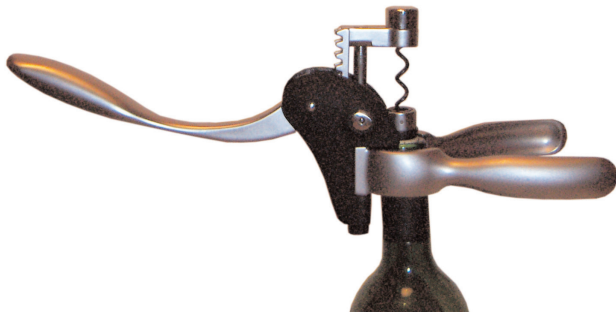
1.



Component A:
ABS



Component B:
aluminium alloy



1. (continued)

Various pictures of a bottle opener are shown opposite.

The bottle opener is produced using a range of manufacturing processes.

(a) Describe **two** benefits of injection moulding component A. **2**

(b) State **two** manufacturing processes which could be used to produce component B and describe a benefit of each process. **4**

(c) Describe a difficulty associated with manufacturing **one** of the components and explain how it could be resolved. **3**

(Use sketches to illustrate your answer.)

(d) Describe a difficulty associated with assembling the component parts and explain how it could be resolved. **3**

(Use sketches to illustrate your answer.)

The bottle opener must maintain a high level of quality assurance.

(e) Describe how this could be achieved. **2**

(14)

[Turn over



The sales of design classics such as the Victorinox Swiss Army Knife shown above can decline over a period of time.

(a) Outline **two** reasons why product sales may decline.

2

To maintain the sales, a company could choose to redesign the product. Before doing so, the company would have to gain information about their existing product.

(b) Describe the types of information which could be gathered using field and desk research.

4

Redesigning a product can be expensive for a company.

(c) Outline **three** less expensive alternatives to redesign which would help maintain sales for the company.

6

(12)

3.

Marks



Product Jug Kettle
Designer Russell Hobbs
Cost £10.00
Material ABS

Product Hot Bertaa
Designer Starck
Cost £100+
Materials Aluminium and plastic

Two kettles are shown above with product information.

- (a) State and justify an appropriate target market for each kettle. 4
- (b) Give **two** possible reasons for the marked difference in price of the two kettles. 4

The resolution of aesthetics and function is essential for the success of any commercial product.

- (c) (i) Discuss the balance between aesthetics and function for each of the kettles. 4
- (ii) Explain how a designer could resolve the balance between aesthetics and function when designing products. 4

(16)

[Turn over

- | | <i>Marks</i> |
|---|--------------|
| <p>4. Advances in computer technology have offered new opportunities for design teams.</p> <p>Identify how computer technology has been used in <i>developing</i>, <i>testing</i> and <i>manufacturing</i> new products and describe the benefits these bring to the design team.</p> | (12) |
| | |
| <p>5. The planning and organisation of tasks are essential before a design project is started.</p> <p>(a) Describe three key tasks that should be undertaken when planning and organising a design project. Outline the possible consequences of the tasks not being undertaken.</p> | 6 |
| <p>(b) The design process could split into three incremental stages:</p> <ul style="list-style-type: none"> • research • development • presentation. | |
| <p>(i) Describe, using products with which you are familiar, how the importance of these stages can vary from product to product.</p> | 6 |
| <p>(ii) Identify a problem which could occur during each stage listed above and describe how any two of them could be resolved.</p> | 7 |
| | (19) |

6.

Marks



**Cantilever chair by
Verner Panton**

In the 1960s, Verner Panton designed the first, single section plastic, stackable chair. The chair went on to be a great success winning numerous awards. However, launching a new and innovative product can involve risks.

- (a) Identify **three** potential risks in launching a product and explain how they may be overcome.

9

When designers are developing products they often work as part of a team. These teams could be either “in-house” or “consultants”.

- (b) Describe the benefits of each type of team.

**6
(15)**

[Turn over for Question seven on *Page eight*

7. Answer *either* Question 7(a) or 7(b).

Marks

(a) Environmental issues impact on the design of products.

These issues include:

- depletion of natural resources
- pollution during manufacture
- energy consumption
- sustainability
- planned obsolescence
- redundancy
- waste disposal.

Environmental issues are considered more in the design of some products than with others.

Justify this statement using products with which you are familiar.

12

OR

(b) Many products evolve over a long period of time and are influenced by social and technological advances.

Describe how these influences have affected products with which you are familiar.

12

(12)

[END OF QUESTION PAPER]

ACKNOWLEDGEMENTS

Question 2 — Photograph of a Victorinox Swiss Army Knife is reproduced by kind permission of Victorinox.

Question 3 – Photograph of a Russell Hobbs kettle is reproduced by kind permission of Russell Hobbs.

Question 3 – Photograph of “Hot Bertaa” kettle is reproduced by kind permission of Philippe Starck.

Question 6 – Photograph of “Cantilever Chair” by Verner Panton © 2007 Digital Image, The Museum of Modern Art, New York/Scala, Florence.