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*).

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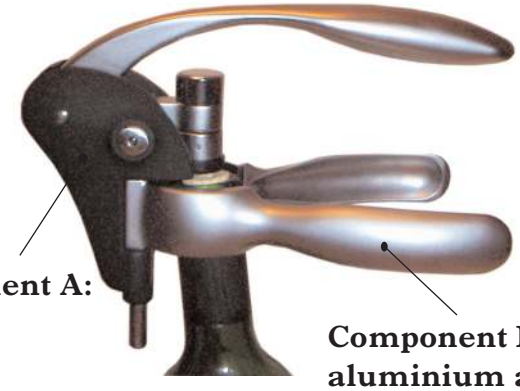
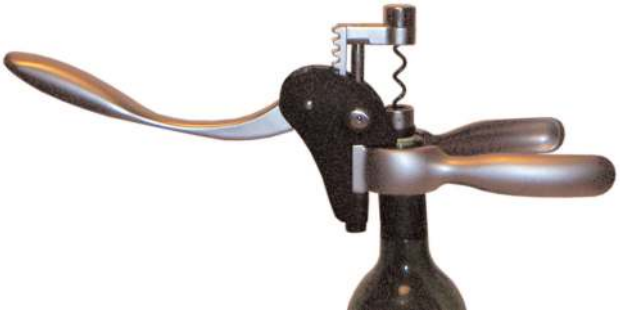
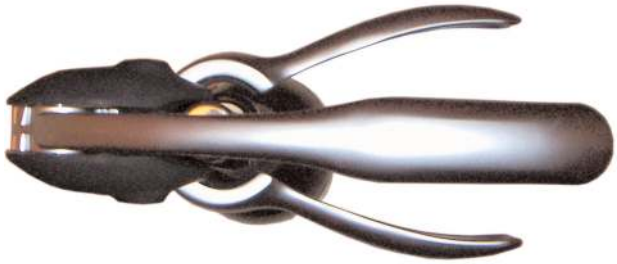
Attempt ALL questions.

1.







Marks

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

Marks

2.

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)

Marks

3.

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

Marks

4. Advances in computer technology have offered new opportunities for design teams.

Identify how computer technology has been used in *developing*, *testing* and *manufacturing* new products and describe the benefits these bring to the design team. **(12)**

5. The planning and organisation of tasks are essential before a design project is started.

(*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. **6**

(*b*) The design process could split into three incremental stages:

- research
- development
- presentation.

(i) Describe, using products with which you are familiar, how the importance of these stages can vary from product to product. **6**

(ii) Identify a problem which could occur during **each** stage listed above and describe how any **two** of them could be resolved. **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 — Photogarph 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.