

354/01

**DESIGN AND TECHNOLOGY**

**PRODUCT DESIGN DT4**

P.M. TUESDAY, 19 June 2007

(3 Hours)

**ADDITIONAL MATERIALS**

In addition to this examination paper, you will need a 12 page answer book.

**INSTRUCTIONS TO CANDIDATES**

Answer **three** questions from Section A.

Answer **four** questions from Section B.

Answer **two** questions from Section C.

**INFORMATION FOR CANDIDATES**

When and where appropriate, answers should be amplified and illustrated with sketches and/or diagrams.

**Section A** and **Section B** answers should be no more than half a page. These sections are designed to demonstrate your **breadth** of knowledge in Product Design.

Your **Section C** answers should be substantial and demonstrate your **depth** of knowledge in Product Design.

Candidates are reminded of the necessity for good English and orderly presentation in their answers.

**SECTION A**

Answer **three** questions from this section.

The maximum length of each answer should be no more than about 150 words.  
This section is designed to demonstrate your **breadth** of knowledge in Product Design.

**Each question carries 8 marks.**

1. (a) Describe the *product life cycle* using diagrams where relevant. [4]  
(b) Draw a labelled diagram demonstrating the life cycle of a product with a slow rate of adoption. [4]
2. For a named product of your choice, identify **two** *incremental improvements* and briefly describe the impact **each** has had on the function or performance of the product. [8]
3. Describe the importance of *market pull* as a driving force for product innovation. [8]
4. Explain how the *build quality* of products could impact positively on the environment. [8]
5. When researching the market prior to product development explain the importance of:  
(a) the target audience; [4]  
(b) market trends. [4]

**SECTION B**

Answer **four** questions from this section.

The maximum length of each answer should be no more than about 150 words.  
This section is designed to demonstrate your **breadth** of knowledge in Product Design.

**Each question carries 8 marks.**

6. Explain what you understand by the term *Intellectual Property*. [8]
7. Name a management system for product manufacture and describe how that system can address quality control when used in the production process. [8]
8. *Visible consumer required characteristics* are important features of products. Describe why they are important when analysing a **specific named** product. [8]
9. Describe a method of permanently joining:
- (a) two similar named materials; [4]
  - (b) two named materials which are significantly different in their properties and characteristics. [4]
10. (a) Explain what is meant by the term *ergonomics*. [4]
- (b) Show how ergonomic considerations are vital to the successful development and use of a specific named product. [4]
11. Name four smart materials and describe the characteristics which enable them to be classified as *Smart*.  $4 \times [2]$

### SECTION C

Answer **two** questions from this section.

Your answers should be substantial and show the **depth** of your knowledge in *Product Design*.

**Each question carries 22 marks, 2 of which are for clarity of communication.**

12. Identify a specific product, or a range of products, and give a detailed account of the changes in design and/or styling that have been attributed to a product designer or design movement, from the 1970s onward. [22]
13. Give a detailed description of **two** renewable materials that have been used to replace non-renewable materials in specific named products. In your description discuss the particular purpose, characteristics and working properties of both materials that make them appropriate. [22]
14. “...passively complying with environmental laws is not the same as actively designing to improve the environmental performance of a product.”  
(Edwin Datschefski – *The Total Beauty of Sustainable Products* – RotoVision 2001)
- Discuss how product designers can become active designers in improving the environmental performance of products they design. [22]
15. The *Four Ps* are features which can have a significant impact when selling products in the market place.
- Describe the essential features of **each** of the *Four Ps* and relate them to a product of your choice, indicating how each influences the marketability of the product. [22]
16. Logistics management has had a significant role to play in developing profit making product design manufacturing companies.
- Fully discuss this statement. [22]