



GCE AS/A level

1111/01

**DESIGN AND TECHNOLOGY
PRODUCT DESIGN DT1**

P.M. WEDNESDAY, 18 May 2011

2 hours

ADDITIONAL MATERIALS

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

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

Answer **five** questions from Section A.

Answer **one** question from Section B.

INFORMATION FOR CANDIDATES

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

Section A is designed to demonstrate your **breadth** of knowledge in Product Design.

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

You are reminded that assessment will take into account the quality of written communication used in answers that involve extended writing (**Section B**).

SECTION A

Answer **five** questions from this section.

This section is designed to demonstrate your **breadth** of knowledge in Product Design.

Each question carries 8 marks.

1. (a) Explain the difference between *qualitative* and *quantitative* performance criteria when drawing up a design specification. [4]
- (b) For a named product, state **two** examples of *qualitative* performance criteria and **two** examples of *quantitative* performance criteria. $2 \times [2]$

2. Both ergonomics and anthropometrics make an important contribution to the successful design of products.

Describe **two** examples where:

- (a) Ergonomics are important within working environments. $2 \times [2]$
- (b) Anthropometrics are important in the design of products. $2 \times [2]$

3. *Gantt* charts and *Flow* charts are effective project management systems used by designers and manufacturers.

- (a) Describe the main features of **both** project management systems. $2 \times [2]$
- (b) Explain how they are effectively used in project management. [4]

4. Materials may be classified into the following categories:

- Natural
- Regenerated

Name **two** specific materials within each category and describe their particular properties or characteristics. $2 \times [4]$

5. Describe the features and benefits of the following *Intellectual Property Rights* with reference to specific products within each:

(a) Patents. [4]

(b) Trade marks. [4]

6. Products are manufactured using materials that are self-finished or require a finish to be applied to them.

(a) Name a finish that can only be applied during manufacturing and give a reason why this is appropriate. [4]

(b) Name a finish that is applied by the consumer and give a reason why this is appropriate. [4]

7. BSI (British Standards Institute) and ISO (International Organisation for Standardisation) are quality standards applied to a range of products.

Describe **two** different types of product testing and discuss the positive effects they have on the design of specific products. $2 \times [4]$

8. Performance modelling is a process used by product designers which includes both modelling materials and CAD (Computer Aided Design).

Describe these **two** modelling processes and state the advantages of **each**. $2 \times [4]$

SECTION B

Answer **one** question from this section.

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

Each question carries 30 marks.

9. *Successful designers create products using their understanding of technology, production methods and market needs.*

Discuss the validity of this statement in relation to a specific product or range of products.[30]

10. Getting the right material or component delivered at the right time is essential for an efficient and economic production line.

Describe how this is achieved and its advantages to the manufacturer. [30]

11. When designing products, designers consider the implications of:

(a) Materials selection.

(b) Product disposal.

Discuss the importance of these areas in relation to product design. [30]