GCE AS/A level

1111/01

DESIGN AND TECHNOLOGY – DT1

PRODUCT DESIGN

A.M. MONDAY, 23 May 2016

2 hours plus your additional time allowance

ADDITIONAL MATERIALS

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

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball-point pen or your usual method.

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).

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

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. **Smart materials and composite materials are often used to manufacture modern day products.**

   (a) Identify ONE smart material and describe the advantages of using it in a named product. [4]

   (b) Identify ONE composite material and describe the advantages of using it in a named product. [4]

2. Patents, Copyrights, Registered Trade Marks and Design Rights are all forms of protection granted by the Patent Office.

   Explain the features and protection of any TWO of these with reference to specific products. 2 × [4]

3. All designers consider the use of ergonomics and anthropometrics in order to design successful products.

   Describe using examples why:

   (a) ergonomic principles are important in the design of products; [4]

   (b) anthropometric data is important in the design of products. [4]

4. (a) State the benefits of making a physical three-dimensional model when developing a design proposal. [4]

(b) State the benefits of making a final three-dimensional prototype prior to manufacturing. [4]

5. (a) Name a finishing process that can only be applied during manufacturing to a named product and explain why this is appropriate. [4]

(b) Name a finishing process that needs to be applied by the consumer after the manufacture of a named product and explain why this is appropriate. [4]

6. Reverse engineering involves the disassembly of a product.

Explain in detail how product disassembly benefits the designer.

[8]

7. (a) Explain why bought-in or standardised part-assembled components are used when manufacturing products. [4]

(b) Describe ONE advantage and ONE disadvantage of using bought-in or standardised part-assembled components to the designer or manufacturer.

2 × [2]

8. The use of Computer Aided Design (CAD) and Computer Aided Manufacture (CAM) has now become an integral part of the design process for both designers and manufacturers when creating products.

(a) Describe the benefits of using CAD to the designer. [4]

(b) Describe the benefits of using CAM to the manufacturer. [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. Production lines rely on getting the right material or component delivered at the right time and place. This is often referred to as 'Just in Time' (JIT).

Describe the importance of this and explain how it is achieved along with the advantages to the manufacturer. Use examples of products to fully explain how this principle is used to its full effect. [30]

10. **Sustainability policies require the designer to consider the importance of material selection and product disposal.**

    Discuss the importance of this statement when developing new products. [30]

11. **Discuss how trends, styles and new technical capabilities have all influenced the design, production and sale of products. [30]**

END OF PAPER