

351/01

DESIGN AND TECHNOLOGY AS

PRODUCT DESIGN DT1

A.M. TUESDAY, 5 June 2007

(2½ Hours)

ADDITIONAL MATERIALS

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

INSTRUCTIONS TO CANDIDATES

Answer **six** 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 answers should be no more than half a page. This section 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 of the necessity for good English and orderly presentation in your answers.

SECTION A

*Answer **six** 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. Describe the features and characteristics of products that would make them suitable for:
 - (a) batch production; [4]
 - (b) mass production. [4]

2. Describe how two-dimensional (2D) and three-dimensional (3D) modelling and prototyping are used to assess design proposals. [8]

3. *Primary processing* and *secondary processing* are **two** important stages in the production process.
 - (a) Define these **two** stages of production. 2 x [2]
 - (b) Describe the processes that will be specific to **each** in a named product. 2 x [2]

4.
 - (a) Define the term *Just in Time* (JIT) in manufacturing. [2]
 - (b) List **three** benefits of JIT to the manufacturer. 3 x [2]

5. Flow charts, GANTT charts and critical path analysis charts are used by product designers and manufacturers within project management.
For any two of the above project management systems:
 - (a) describe the main features; [4]
 - (b) describe how they are used in effective project management. [4]

6.
 - (a) Explain the term *Reverse Engineering*. [2]
 - (b) For a specific product identify **three** important insights a designer might gain through reverse engineering. 2 x [3]

7. BSI (British Standards Institution) and ISO (International Organisation for Standardisation) standards apply to a range of consumer products.

Describe **four** positive effects that these standards have on the design of products. 2 x [4]

8. (a) Name and categorise **three** regenerated materials and **three** alloys or composite materials. [6]

(b) Name a specific application of **one** material in **two** of the categories. [2]

9. Describe **two** qualitative and **two** quantitative tests which can be carried out on a named product or component. 2 x [4]

10. Materials such as Acrylic, PET (polyethylene terephthalate), Polyester and PVC (polyvinyl chloride) have replaced many traditional materials used in products.

For any **two** of the above materials:

(a) name the traditional material which has been replaced in a specific product; 2 x [1]

(b) state **three** benefits that **each** replacement material brings to the product. 2 x [3]

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 22 marks, 2 of which are for clarity of communication.

- 11.** Global manufacturing can involve the *research* and *design development* being undertaken in one country and *production* in another.

Discuss the advantages and disadvantages of global manufacturing to the designer, manufacturer and consumer. [22]

- 12.** The applications of ICT have a significant effect on traditional manufacturing processes. Discuss the advantages and disadvantages the use of ICT has had on manufacturing processes. [22]

- 13.** When designing, aesthetics, function, maintenance, cost and disposal are important considerations for the product designer.

Discuss this statement in relation to named products. [22]