



**GCE A level**

1113/03

**DESIGN AND TECHNOLOGY – DT3**  
**Systems and Control Technology**

A.M. TUESDAY, 3 June 2014

2 hours 30 minutes

**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 **three** questions from Section A.

Answer **three** 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 are designed to demonstrate your **breadth** of knowledge in Systems and Control Technology.

Your **Section C** answers should be substantial and demonstrate your **depth** of knowledge in Systems and Control Technology.

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

**SECTION A**

Answer **three** questions from this section.

This section is designed to demonstrate your **breadth** of knowledge in Systems and Control Technology.

**Each question carries 8 marks.**

1. Identify the kind of information that is gathered by designers when compiling client profiles and explain why the information is useful. [8]
  
2. Explain the effect that the anticipated 'life cycle' of a named electronic product has on the design and manufacture of the control system within that product. [8]
  
3. Explain why innovation is important to the process of designing control systems for products. [8]
  
4. Describe what you understand by the term 'technology push'. Identify **two** such products which illustrate innovative 'technology push' features. [8]
  
5. State **two** advantages of constructing electronic circuits on:
  - (a) stripboard; 2 × [2]
  - (b) printed circuit boards (PCB). 2 × [2]

**SECTION B**

Answer **three** questions from this section.

This section is designed to demonstrate your **breadth** of knowledge in Systems and Control Technology.

**Each question carries 8 marks.**

6. (a) Describe what you understand by 'above the line' and 'below the line' analysis.  $2 \times [2]$   
(b) Describe **two** 'above the line' features of a specific named product and **two** 'below the line' features of the **same** product.  $2 \times [2]$
7. Evaluate the importance that modelling a control system has on the eventual success of a product. [8]
8. Outline how the main elements of Registered Design, as prescribed by the Intellectual Property Office, benefit the creator of the design. [8]
9. Describe, with the use of diagrams, **two** different mechanical systems that transfer rotary motion and give an example of **each** in a named product. [8]
10. (a) Explain why the inclusion of accurate and complete dimensions is essential to the design of products. [4]  
(b) Describe the relationships between dimensioning and the mass manufacture of a specific product. [4]

**SECTION C**

*Answer **two** questions from this section.*

*Your answer should be substantial and show the **depth** of your knowledge in Systems and Control Technology.*

***Each question carries 26 marks.***

**11.** Describe the ways in which **two** product designers of your choice, from the early 1970s to the present day, have sought to influence their chosen market segments. [26]

**12.** Identify the properties of specific control components that have been used in a named product and describe how their selection has benefited performance issues of the named product. [26]

**13.** Modernising traditional or 'retro' styled products often provides opportunities for designers to incorporate state of the art control systems.

Using named examples, explain how designers have combined these factors in products. [26]

**14.** "The Measure of Man and Woman, human factors in design is said to be one of the classic tools for fitting products and environments to people."

*Stephen B Wilcox, Introduction – The Measure of Man and Woman*

Fully explain how anthropometric data and ergonomic rules are of benefit to the designer. [26]

**15.** Describe how the four Ps are instrumental in achieving maximum sales for products. [26]

**END OF PAPER**