



GCE AS/A level

1111/03

DESIGN AND TECHNOLOGY – DT1
Systems and Control Technology

A.M. WEDNESDAY, 14 May 2014

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 Systems and Control Technology.

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

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 Systems and Control Technology.*

Each question carries 8 marks.

1. Synthetic plastics are used in electronic and small mechanical components.
 - (a) Identify **two** specific electronic or small mechanical components and the specific synthetic plastics that are used in the construction of **each**. 2 x [1]
 - (b) For **each** component explain why these synthetic plastics are used. 2 x [3]

2. Product designers and manufacturers use research methodologies to investigate sources of information which aid the design and manufacture of products.
 - (a) Explain the terms Primary and Secondary research. 2 x [2]
 - (b) Describe the type of information that is gained through **both** Primary research and Secondary research. 2 x [2]

3. Patents, Copyrights, Registered Trade Marks, Registered Design and Design Rights are distinct intellectual property rights granted by the Intellectual Property Office.

Describe the features and protection provided by **two** of the above intellectual property rights. 2 x [4]

4. Reflow and wave form soldering are commonly used in the commercial production of electronic circuits.

Describe **each** process. 2 x [4]

5. Both breadboard modelling and CAD (Computer Aided Design) simulations are used in the development of control systems.

(a) Describe **two** benefits of breadboard modelling to the designer. 2 x [2]

(b) Describe **two** benefits of CAD (Computer Aided Design) simulations to the manufacturer. 2 x [2]

6. GANTT charts, flow charts and critical path analysis charts are used by designers and manufacturers within project management.

For any **two** of the above project management systems:

(a) state the main features of **each**; 2 x [2]

(b) describe how they are used within project management. [4]

7. (a) Explain the term Reverse Engineering. [2]

(b) Identify **three** important insights a designer would gain by conducting Reverse Engineering on a named product. 3 x [2]

8. Anthropometric data is used in the design of products to ensure ease of use.

Explain how designers have successfully used anthropometric data in **four** named products.

4 x [2]

SECTION B

Answer one question from this section.

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

Each question carries 30 marks.

- 9.** Global manufacturing continues to expand in order to meet the needs of consumers.

Discuss the advantages and disadvantages of global manufacturing for the designer and manufacturer. [30]

- 10.** Systems are being made smaller and smaller, but this is not always desirable in products.

Discuss why consumers may want products that are constructed larger than the system would require and the implications this has for the manufacturer. [30]

- 11.** Product designers consider aesthetics, function, maintenance, cost and disposal when developing products for mass production.

Discuss the implications of this statement in relation to named products. [30]

END OF PAPER