



GCE AS/A level

1111/03



S15-1111-03

DESIGN AND TECHNOLOGY – DT1
Systems and Control Technology

A.M. TUESDAY, 2 June 2015

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. Creating a time delay in a system can be achieved using microprocessor, electronic and pneumatic circuits.

With the aid of sketches describe **two** different methods of creating time delays in systems.

2 × [4]

2. (a) Describe the main features of a high volume production system. [4]

(b) Explain **four** benefits of a high volume production system to the manufacturer. 4 × [1]

3. Products that are certified by the British Standards Institute (BSI) have passed specific tests before use by the consumer.

Name **four** products that are BSI certified and describe a specific test that **each** needs to pass. 4 × [2]

4. Plain bearings can be used in drive systems to support radial rotating shafts.

(a) Describe a plain bearing. [2]

(b) State **two** materials used for plain bearings and explain why they are suitable. 2 × [3]

5. Product designers use information from both primary research and secondary research to inform their designing.
- (a) Describe the kind of information identified through **primary research**. [4]
 - (b) Describe the kind of information identified through **secondary research**. [4]
6. Explain the following terms:
- (a) Reverse Engineering as used within design and production. [4]
 - (b) Concurrent Engineering as used within product development. [4]
7. (a) Explain the terms **qualitative** and **quantitative** performance criteria when used in a design specification. $2 \times [2]$
- (b) Within the specification for a named product, state **two** examples of **qualitative** performance criteria and **two** examples of **quantitative** performance criteria. $2 \times [2]$
8. With reference to the production of an electronic circuit for a particular product, explain what is meant by quality control and state why it is important to the manufacturer. [8]

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. With reference to at least **two** different products, explain why both **styling** and **image creation** are important in product development, commenting on the importance of these factors to the consumer. [30]

10. Technological developments have had an inevitable impact on the design and manufacture of products.

Explain how technological developments and new materials/components have improved the manufacture, function, and appeal of named products. [30]

11. Designers create products using their knowledge and understanding of electronic components, production methods and market needs.

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

END OF PAPER