

General Certificate of Education
Summer 2003
Advanced Subsidiary Examination



**DESIGN AND TECHNOLOGY:
SYSTEMS AND CONTROL TECHNOLOGY**
Unit 3 Design and Market Influences (SCT3)

SCT3

Friday 6 June 2003 Morning Session

In addition to this paper you will require:

- an unlined answer book (7024);
- normal writing and drawing instruments;
- two sheets of A3 paper for use with Question 2 (enclosed).

Time allowed: 1 hour 30 minutes

Instructions

- Use blue or black ink or ball-point pen. Pencil and coloured pencils should only be used for drawing.
- Two sheets of A3 paper are provided for use with Question 2. *No further sheets are to be used.*
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. *The Paper Reference* is SCT3.
- Answer **both** questions.

Information

- The maximum mark for this paper is 100 marks, 4 marks of which are for Quality of Written Communication.
- Mark allocations are shown in brackets.
- This paper carries 30 per cent of the total marks for Advanced subsidiary award and 15 per cent for Advanced Level award.
- You are reminded of the need for good English and clear presentation. The Quality of your Written communication will be assessed across all questions.

Advice

- You are advised to spend about 20 minutes on Question 1 and about 1 hour 10 minutes on Question 2.
- Your answers should be illustrated with sketches and/or diagrams wherever you feel it is appropriate.

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Answer **all** questions.

You are advised to spend about 20 minutes on Question 1 and about 1 hour 10 minutes on Question 2.

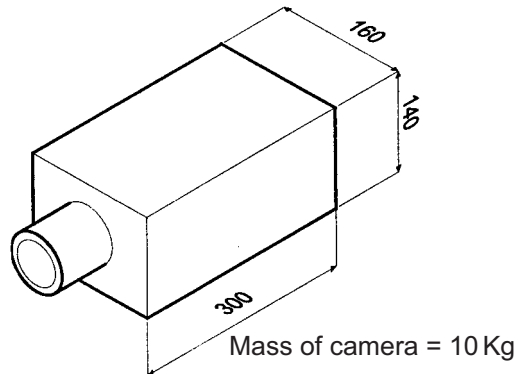
**Theme: SURVEILLANCE SYSTEMS USING CLOSED CIRCUIT TELEVISION CAMERAS
WITH PARTICULAR REFERENCE TO MOVEMENT AND CONTROL.**

1 Closed circuit surveillance systems are now a common sight in most high streets.

- (a) (i) Describe **two** advantages these systems bring to society as a whole. *(4 marks)*
- (ii) Describe **one** disadvantage these systems may have for the individual. *(2 marks)*
- (b) (i) List and explain **three** factors that need to be considered when deciding on the positioning of cameras in a high street. *(6 marks)*
- (ii) Discuss the limitations of closed circuit surveillance systems as a method of providing security. *(8 marks)*

Use the **two** separate A3 sheets provided to answer Question 2 where appropriate.
Clearly indicate the sections of the question you answer on the sheets.

- 2 You have been asked to design a closed circuit surveillance system using the camera illustrated below. The camera is to be mounted on a bracket connected to the corner of a building and is operated from a remote location.



- (a) (i) With the aid of sketches, show a mechanical system that would be capable of slowly rotating the camera through a minimum angle of 270 degrees. The system should be driven by an electric motor. *(8 marks)*
- (ii) Draw a control circuit that would allow the direction of rotation of the motor to be reversed. The circuit should include a method of automatically reversing the motor when the limits of the cameras rotation are reached. *(10 marks)*
- (iii) With the aid of sketches, show a system that would make the camera tilt through an angle of approximately 45 degrees. The camera should remain in position when the power source is removed from the tilt system. *(6 marks)*

QUESTION 2 CONTINUES ON THE NEXT PAGE

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- (b) Develop your ideas from question 2(a) into a design for a complete system that would allow the camera 270 degrees of rotation and 45 degrees of tilt.

Your design should show:

- How the rotation is achieved.
- How the tilt is achieved.
- The method of attaching the system to the bracket.
- The power requirements of the system.
- The design of the bracket.
- The method of attachment to the wall.

(52 marks)

Marks will be awarded as follows,

Quality of communication	<i>8 marks</i>
Development of the system	<i>20 marks</i>
Originality and innovation	<i>4 marks</i>
Appropriateness of materials and components	<i>10 marks</i>
Methods of construction	<i>10 marks</i>

END OF QUESTIONS