

General Certificate of Education
June 2004
Advanced Subsidiary Examination



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

SCT3

Monday 14 June 2004 Morning Session

In addition to this paper you will require:

- a lined answer book (AB08);
- 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 be used only 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, 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.

Answer **all** questions.

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

Theme: Food and Drinks Vending Machines – How they work and where they are used

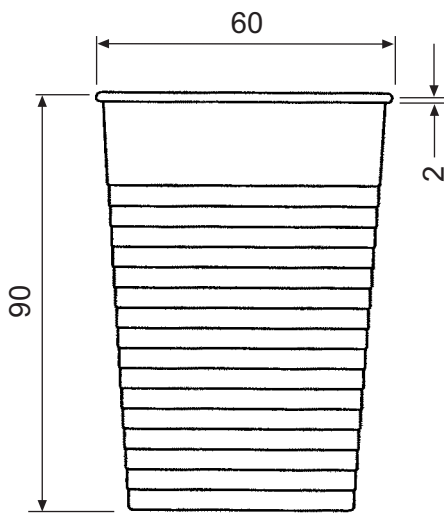
- 1** Food and drinks vending machines have become more common in a variety of situations.
- (a) Identify and explain **two** key factors which have led to the change described above, using examples to illustrate your answer. *(2×3 marks)*
 - (b) Describe **two** advantages vending machines bring to the *consumer*; *(2×2 marks)*
 - (c) Describe **two** advantages vending machines bring to the *retailer*; *(2×2 marks)*
 - (d) Describe **three** criteria that would need to be considered when identifying a suitable site for a hot drinks' vending machine. *(3×2 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 In tea/coffee vending machines the customer inserts the correct value of coins and selects the type of drink required. The machine then delivers a cup and fills this with the correct combination of hot water, coffee, tea, milk and sugar to match the selection made.

(a) Produce a flowchart showing the main stages of the operation of the vending machine. (8 marks)

(b) The diagram shows the dimension of a cup in millimetres, the photograph shows five stacked cups.



- (i) Using an annotated sketch to support your answer suggest a storage system that would hold approximately 100 cups. (4 marks)
- (ii) With the aid of sketches, suggest **two** methods that could be used to deliver a single cup from the storage system for filling. (2×4 marks)
- (iii) Design **one** method of delivering 200 ml of water from a storage tank to fill the cup. (1 millilitre = 1 cubic centimetre) (8 marks)

QUESTION 2 CONTINUES ON THE NEXT PAGE

Turn over ►

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- (c) *Develop* your ideas from part 2 (b) into a design for a system that dispenses a cup and fills it with 200 ml of water when a signal has been received.

Your design should show:

- How the cups are stored
- How a single cup is dispensed
- The water storage tank
- The method of delivering 200 ml of water
- The control system

This question is worth 48 marks.

Marks will be awarded as follows

- | | |
|--|------------|
| (i) Quality of communication | (8 marks) |
| (ii) Development of the system | (20 marks) |
| (iii) Originality and innovation | (4 marks) |
| (iv) Appropriateness of materials and components | (8 marks) |
| (v) Methods of construction | (8 marks) |

END OF QUESTIONS