



ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme

June 2003

GCE

Design and Technology Systems and Control

Unit SCT1

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Systems and Control Technology: Unit 1

Quality of Written Communication

The following marks are allocated to the quality of the candidate's written communication. Make a separate assessment of the candidate's overall ability as demonstrated across the paper using the criteria given below.

<i>Performance Criteria</i>	Marks
The candidate will express complex ideas extremely clearly and fluently. Sentences and paragraphs will follow on from one another smoothly and logically. Arguments will be consistently relevant and well structured. There will be few, if any, errors of grammar, punctuation and spelling.	4
The candidate will express moderately complex ideas clearly and reasonably fluently, through well-lined sentences and paragraphs. Arguments will be generally relevant and well structured. There may be occasional errors of grammar, punctuation and spelling.	3
The candidate will express straightforward ideas clearly, if not always fluently. Sentences and paragraphs may not always be well connected. Arguments may sometimes stray from the point or be weakly presented. There may be some errors of grammar, punctuation and spelling, but not such as to suggest a weakness in these areas.	2
The candidate will express simple ideas clearly, but may be imprecise and awkward in dealing with complex or subtle concepts. Arguments may be of doubtful relevance or obscurely presented. Errors in grammar, punctuation and spelling may be noticeable and intrusive, suggesting weaknesses in these areas.	1

NB This mark scheme is intended as a guide to the type of answer expected but is not intended to be exhaustive or prescriptive. If candidates offer other answers which are equally valid **they must be given full credit.**

Many responses at this level are assessed according to the **quality** of the work rather than the number of points included. The following level descriptors are intended to be a guide when assessing the quality of a candidate's response.

The candidate has a basic but possibly confused grasp of the issues.
Few correct examples are given to illustrate points made. Description may be unclear.

(low mark range)

The candidate has some knowledge but there will be less clarity of understanding.
Some correct examples given to illustrate points made. Description better but unclear or confused in parts.

(mid mark range)

The candidate has a thorough understanding of the issues and has provided relevant examples to support the knowledge shown. This candidate's answer shows clear evidence of understanding.

(high mark range)

Question 1

- | | | | |
|-----|--|---|------------|
| (a) | Each relevant point of the flow chart in a logical order
Feed back loop | (1 mark)
(2 marks) | (12 marks) |
| (b) | Suitable system for three lights
Capable of producing relevant delays
Capable of producing length of sequence
Method of producing sequence explained
Control of 230v a.c. (Possible interface) | (2 marks)
(2 marks)
(2 marks)
(2 marks)
(4 marks) | (12 marks) |
| (c) | One control circuit can be used for many applications
Sequence can be easily altered
Sequence can vary according to traffic flow
Possible central control
Possible interlocking etc | (2 marks)
(2 marks)
(2 marks)
(2 marks)
(2 marks) | (8 marks) |
| (d) | Each criteria
Related reason
Example: - weather resistant – to stop
water getting into electrical circuits | (1 mark)
(1 mark) | (2 marks) |

Question 2

Breadboard

Used to model a circuit, easy replacement of parts, easy modification, low cost, speed, try many possibilities, components can be re-used etc

Stripboard

More permanent, allows a circuit to be tested in a situation. Quick to produce, electrically secure, easier than production of PCB etc

PCB

Final prototype/production, after modelling and testing by other means, possible to mass produce, electrically secure, smaller, designed for situation etc

(Each point 2 marks) (24 marks)

- | | | | |
|-----|---|----------------------|---------------|
| (b) | Each identified risk
Each related solution | (1 mark)
(1 mark) | (2 x 2 marks) |
|-----|---|----------------------|---------------|

Question 3

- | | | |
|--------------------------------|---------------|------------|
| Quality of communication | (2 marks) | |
| Correct form of amplification | (2 marks) | |
| Amplification by a factor of 3 | (3 marks) | |
| | (4 x 7 marks) | (28 marks) |

Total 28 marks

Question 4

- | | | | | |
|-----|------|---|---------------|-----------|
| (a) | (i) | Any suitable method eg. 7 Segment, Graphical, pointer | (1 mark) | |
| | | Description of method | (1 mark) | |
| | | | (3 x 2 marks) | (6 marks) |
| | (ii) | Suitable use (1) why appropriate (1) | (2 marks) | |
| | | | (3 x 2 marks) | (6 marks) |
| (b) | (i) | Correct connection of BCD | (2 marks) | |
| | | Correct connection of decoder to 7 segment | (4 marks) | (6 marks) |
| | (ii) | Selection of relevant output (1) mark | (3 marks) | |
| | | Connection of AND gates | (2 marks) | |
| | | Connection to reset pin | (1 mark) | (6 marks) |

Total 24 marks

TOTAL MARKS FOR PAPER: 100