



General Certificate of Education

**Design and Technology
(Systems and Control
Technology)
SYST 1**

Written Paper

Report on the Examination

2009 examination – June series

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Set and published by the Assessment and Qualifications Alliance.

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General

This was the first examination sitting of the new GCE Design & Technology: Systems and Control Technology specification. Centres should be highly commended for the quantity of work they have had to undertake in assimilating the requirements of the new specification, and in the amount of time they must have taken in preparing their candidates for the new format of examination. The quality of responses suggested that candidates had been well prepared for the new examination in both the written and design based questions.

This year the SYST1 paper was marked online and candidates should be aware that they should only answer questions in the spaces allocated on the paper and use an additional answer sheet if their answer extends outside the allocated area. Candidates must also ensure that any additional sheets they use are fully labelled with their name, centre number and candidate number.

The use of sketching and annotation continues to be of a high standard in both the short and long answer questions.

Section A - Compulsory

Question A1

This question was well answered by the majority of candidates however a significant number thought that non-ferrous related to the physical property of a metal such as malleability or ductility.

Question A2

The majority of candidates gained full marks on this question although a number did confuse thermoforming with thermosetting plastics.

Question A3

Most candidates were able to sketch a double pole double throw switch with many drawing an accompanying circuit to go with it, which was not necessary. However the explanations of how the switch worked were rather limited.

Question A4

This question was not well answered by most of the candidates. Many confused a closed loop system with an open loop one and a significant number thought that a closed loop system was something that would 'go on forever until you switched it off'.

Question A5

Well answered by the majority of candidates. Most sketches detailed a cam and follower or crank and slider. However a number of candidates failed to gain full marks by omitting a guidance system that would ensure that the follower or slider would reciprocate correctly. A number of candidates sketched a rack and pinion system which did not gain credit.

Question A6

This question was not as well answered as the previous one, with a significant number of candidates simply copying their answer from the previous question and making minor modifications which unfortunately did not result in an oscillating output.

Section B – Answer one of two optional questions.

In this paper the vast majority of candidates opted to answer question 7 as opposed to question 8, however both questions appeared to test candidates in equal measure.

Question B7 (a)

Three-quarters of candidates gained at least half marks on this question, with those describing the 'photo-etch' method of producing a PCB generally doing better than those who described PCB manufacture using a CNC-based system. There is still confusion in candidate's minds over the order of the processes when photo-etching a PCB with many getting the developing of the image and the etching of the circuit board the wrong way around. Candidates who described a CNC-based process of producing a PCB fared less well with most unable to describe the process once they 'had sent the file to the CNC machine'.

Question B7 (b)

Nearly all candidates were able to provide two health and safety risks and the associated control measures.

Question B7 (c)

This question was generally well answered, although only a fifth of candidates gained full marks, with many answers requiring greater substance. Many candidates used the same adjective such as 'cheap' for both breadboard and computer simulation packages, without qualification. Good answers included reference to such things as breadboards being useful for testing the effect of environmental factors, for example temperature or switch bounce.

Question B8 (a)

The majority of students who attempted this question were able to identify two situations where frictional forces were undesirable and provide suitable methods of reducing them.

Question B8 (b)

This question was generally well answered, with candidates providing annotated sketches of a variety of bicycle and car braking systems. Some of the drawings were, however, lacking in detail and it was not always clear how the system worked.

Question B8 (c)

The vast majority of candidates who attempted this question gained full marks for providing the correct answer with units, although the working out was very poor in many cases.

Section C - Compulsory

Question C9 (a)

Three-quarters of candidates gained at least half marks for this question. Sketches could do with being larger and clearer in many cases, with a number of candidates not making the method of connecting the drive system to the bollard clear enough to show how the bollard was to be lowered.

Question C9 (b)

This question was not particularly well answered by the majority of candidates. Many PIC-based circuits did not include a programme or flowchart and many candidates who chose to use a DPDT switch made errors in wiring up either the reversing circuit or the limit switches.

Question C9 (c)

A generally well answered question with the majority of candidates drawing an LDR-based transistor switching circuit to control the four LEDs. PIC-based circuits and ones involving solar panels charging batteries also gained credit.

Question C9 (d)

A well answered question, with candidates showing a good ability to 'join up' their thinking from the previous parts and create realistic and functional complete systems.

Question C9 (e)

Most candidates attempted this question and many provided good responses to the question of installation or manufacturing issues. A significant proportion of candidates did however discuss maintenance issues without relating them to the context of installation, failing to gain credit.

Question C9 (f)

The majority of candidates were able to provide a list of suitable materials for the manufacture of system components. Some candidates did not explain which parts of the system were to be made from the materials they had listed and unfortunately were unable to gain marks.