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Examiners' Report Summer 2009

GCSE

GCSE Design & Technology: Systems & Control Technology (1974/3974)

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General Comments

The majority of centres offered coursework projects that enabled their candidates to perform and relate to the requirements of this examination. Some centres are now very well organised in researching and delivering coursework to exemplary levels of achievement. In particular many are now using computer software to assist in circuitry design where they are successfully modelling and testing ideas in 2D. The more able candidates created impressive work which generated a range of technical ideas, modelling using ICT and breadboards and developing one solution in detail. However, in a few cases candidates are simply pasting screen shots of downloaded circuits without providing any analysis of its appropriateness in relation to their own initial ideas. In these cases there is still a need to show further understanding of the controlling aspects of the developing system. The relationship between inputs, processes and outputs must be recognised and related to the project requirements.

In the ideas section many candidates produced too much work relating to casings at the expense of the technology they were studying. This was particularly so for Mechanisms where very few centres considered technical solutions related to their specification content. Although their briefs would have allowed access to all of the assessment criteria many progressed in a manner better suited to the Resistant Materials units. Some centres still need to recognise the need to focus less on the casing designs and more on the system. A balance of two thirds allocated to Systems & Control and one third on the casing designs is appropriate.

Where candidates chose a Mechanisms route the results were often disappointing with many being over awarded. This was often where candidates offered quite simple mechanical solutions without recognising the controlling features of a system. In cases where a candidate offered a mechanical component as part of the solution, there was often a need to show more in-depth understanding of the whole of a mechanical system including that of inputs, process and outputs.

The level of presentation was again varied. Most centres presented neatly bound folders and as suggested, limited the size to approximately 20 pages. Unfortunately, a minority of centres are sending in excessively large folders which contained excessive 'padding' while some are still failing to number the pages. In some cases candidates have not recognised the weighting of the marking scheme and are sometimes offering seven to eight pages of research and just one or two pages on ideas and development.

Photographic quality continues to improve and this greatly assists the moderators. However, there is still the need to focus on key features of the system rather than simply photographing the outer casing.

Criterion 1

There were many centres who recognised and identified tasks which allowed candidates to address all areas of the design & make process. Where candidates themselves chose challenging and imaginative tasks many were successful and scored high marks.

Some centres that provided set tasks for their candidates were able to progress through each designing stage, but quite often it was not easy to see where ownership belonged. In some cases researched material was duplicated and as a result it was not easy to recognise the depth of understanding shown by individual candidates. Those who chose to limit their choice to a simple designing task often missed the opportunity to score marks at the higher level, in these cases many found it difficult to gain access to all of the assessment criteria.

Candidates, who recognised the need to provide an accurate specification, identifying the essential elements that would be used as building blocks in each stage of the designing and making process, were those who were more successful. Research although often quite in-depth did not always focus on the requirements identified in the specification with too much time allocated to form and too little emphasis on System & Control.

For some centres there remains the need to balance the time spent on the different assessment areas. It was disappointing to see, perhaps ten pages of cut and paste type research and just one or two pages of design and development.

Criterion 2

Ideas, Develop and Review

It has been interesting watching the developments in the use of computer software to develop designs. Many are now making use of designing software that offers candidates an opportunity to test ideas. This has for many led to an ability to test and develop ideas requiring quite complex solutions. Some have been able to demonstrate an understanding beyond the requirements of KS4 and have gone on to complete projects by demonstrating high levels of practical skills. On the other hand some have simply used computer generated circuit ideas without demonstrating any analytical understanding and in these cases marks are often difficult to agree.

Centres must take care in allowing candidates to simply use screen shots of circuits as the only contribution to the 'IDEAS' section. It is still expected that candidates use a wide range of strategies to support and develop their ideas. The following statement from a previous Examiners' report is still very much relevant:

"There is a continuing growth in the availability of computer programs that can support the design of circuits and systems and while embracing and encouraging its use, candidates must still recognise the need to 'use a wide range of appropriate sources to develop ideas'. Centres need to ensure their candidates are not simply implanting their idea into a process but are using the process to allow their ideas to grow and develop".

Screen shots of design ideas must be accompanied by the candidate's commentary on the capability of the component parts. This might well be supported with further

analysis of perhaps, how sub-systems can be extended and developed to meet requirements listed in the specification.

Review is an area often missed in the designing process and centres still score badly in this section. Candidates need to reflect on points listed in the original specification. As the design ideas develop the designs features must be measured against each of the specification points.

Criterion 3

Written communication, Other Media and ICT

This section is mostly well done and many score the high marks. Clear written statements and good technical vocabulary used to describe the designing and making process continue to be rewarded. ICT continues to develop with candidates offering a wider range of IT outcomes. The different opportunities now available in terms of designing software promoted a wide range of responses. Far more centres are now able to offer very good IT resources offering candidates the opportunity to score the top mark in this section.

Criterion 4

Systems & Control, Schedule and Industrial Applications

Candidates continued to use flow charts or block diagrams quite often showing the manufacturing process for a PCB. Some centres are still informing their candidates of the need to identify the **inputs, processes and outputs** in the process. Many also fail to score the high marks where they fail to identify where feedback occurs and relates to quality controls.

In most cases, schedules are well done. However, some candidates are failing to score the top mark where they make no reference to time or where their statements are retrospective.

Often still under-marked by centres is 'Industrial applications'. Here, many had designed, developed and processed and shown they understand the manufacture of a printed circuit board, and therefore they have shown sufficient evidence to be awarded a high mark for Industrial Applications.

Criterion 5

Many candidates produced high quality practical work. Unfortunately. some might have improved the finished product by undertaking quite simple tasks like removing component legs following soldering. Some centres may wish to reflect on the marks awarded for Select & Use: a high mark can only be awarded for this section where the candidate has provided evidence in the design folder. Teacher observation is insufficient and it is necessary for candidates to show how they select and use tools and equipment. They must show how processes are safely set up to achieve accurate outcomes and the manufacture of a quality product. Many need to show more detailed understanding of Risk Assessment, a simple list of workshop safety rules will not provide enough evidence for a high mark for 'Safety'.

Photographic quality continues to improve and this greatly assists the moderators. However, some centres are reminded that it is the photos relating to Systems & Control that are required. A simple photo of an outer casing that does not show the circuitry will not be recognised for a high mark.

Criterion 6

Tests, Checks, Evaluation & Modifications

Generally this section is not very well done by many candidates. To gain a high mark in this section there is a need to ensure that the final outcome is tested against the original specification points. Details of how test were set up and how the results have been measured must be considered if the higher mark is to be awarded. Evaluations and modifications must consider the outcomes from these tests which must take account of third party involvement.

For many there is still a need to analyse, draw conclusions and measure the results of their tests, were those who performed well.

Those candidates whose evaluations did reflect the results of tests and checks performed against the original specification, were rewarded with the higher marks, those able to draw conclusions through analysing their ongoing tests and checks, and who, were then able to recognise the strengths and weaknesses of their outcomes, were who were successful.

Where the candidates modifications suggested improvements following evaluating a test, or, as a result of feedback from the target audience, then credit was given.

Summary

Most centres are now quite knowledgeable about the marking scheme and candidates are mostly well guided. In section 4 a small number of centres are still not aware of the need for flowcharts to contain a **key** to identify the **inputs, processes, and outputs**. To gain the high mark award in this section it is necessary to identify each stage of the process including where feedback occurs and relates to quality controls.

Few centres experienced any problems with the administration process. However, a few centres did not send the coursework to the moderator by the required date.

In centres where all candidates addressed the same problem it was difficult to achieve the high mark award in many sections of the marking criteria. In these cases it was difficult for candidates to take full ownership of the designing process. In some cases candidates simply produced the same screen shots of existing circuit diagrams without providing any analysis or commentary on its relationship with the actual problem being tackled. In these cases some might have been better placed in achieving a higher mark for designing had they more ownership of the problem they themselves had researched and identified.

Mostly, centres that have now considerable experience with this exam are promoting and offering their candidates with the opportunity to develop quality designing and making skills. Many are demonstrating an ability to take their skills beyond the requirements of KS4 and are well placed to enter into higher levels of technical

education. In addition, many are now well equipped with problem solving skills that will serve them well in future careers.

Difficulties Relating To Assessment

While most teachers are conscientious in the use of annotation and assessment the following points should be noted: the use of annotation directing the moderator to page numbers where evidence can be found is extremely useful in guiding the moderator.

Some other important thoughts on the moderation process for centres are as follows:

- Some teacher are still rewarding a candidate twice for the same evidence
- Candidates must label each page with their name & candidate number
- Centres are requested not to send practical components through the post
- A3 folders are the preferred size with the suggested limit of 20 pages. Carefully bound folders allow the moderator easy access to each page. Work should not be placed inside envelope type folders
- Please avoid padding; some still send in folders with empty A3 plastic envelopes also heavy wallets and front covers are unnecessary and only increase the weight/cost of posting
- Centres are to be reminded of the importance of sending parcels to the moderators by the correct date.

GCSE Design and Technology: Systems & Control Technology
Principal Examiners' Report - June 2009
1974, Foundation Paper 2F

General Comments

Evidence indicates that candidates were entered at the correct tier. Candidate responses show a clear improvement on previous years, resulting in higher marks being awarded across all parts of the paper.

These comments should be read in conjunction with the question papers and the published mark schemes.

Foundation Paper

Question 1(a) Mean Score – 6.31 from 10 marks

Candidates could identify the LED, wire cutters and soldering iron, but had difficulty with the relay and etching tank. The use of the named components etc., tended to reflect the answers given for the name.

Question 1(b) Mean Score – 1.07 from 2 marks

Most candidates achieved marks by stating 'quick' and 'cheap', but too many gave a single word response of 'easy'.

Question 1(c) Mean Score – 0.9 from 3 marks

Many candidates gave very vague responses, such as 'make circuit'.

Question 1(e) Mean Score – 0.53 from 2 marks

Many candidates gave answers relating to JIT rather than Pick & Place.

Question 1(f) Mean Score – 0.71 from 2 marks

Candidates tended to either give good responses or no response at all to this question.

Question 2(a)(i) Mean Score – 1.77 from 4 marks

Many candidates incorrectly gave D1 as a diode and R3 as a resistor.

Question 2(a)(ii) Mean Score – 0.58 from 1 mark

Well answered.

Question 2(a)(iii) Mean Score – 0.55 from 1 mark

Again, well answered in most cases.

Question 2(a)(iv) Mean Score – 0.08 from 1 mark

Most responses related to controlling the brightness of the LED. Very few correctly identified that the variable resistor would control the sensitivity of the circuit.

Question 2(a)(v) Mean Score – 0.75 from 1 mark

Most candidates correctly identified this as an overall on/off switch.

Question 2(b) Mean Score – 0.62 from 2 marks

It was disappointing how many candidates lost a mark by not writing the correct units for voltage.

Question 2(c) Mean Score – 0.92 from 5 marks

Candidates should be encouraged to avoid giving one-word responses where advantages and disadvantages are asked for.

Question 2(d) Mean Score – 0.89 from 2 marks

Most candidates identified a single reason, but few could provide an appropriate second response. A significant number of students referred to manufacturers rather than consumers.

Question 2(e) Mean Score – 1.00 from 2 marks

Most students could suggest a part of a phone which could be reclaimed.

Question 2(f) Mean Score– 0.79 from 2 marks
Candidates often stated answers rather than justified them, preventing access to a second mark.

Question 3 Mean Score – 8.85 from 22 marks

Question 3 (a)

Generally students drew an Xbox / Play station 3 / Wii controller. More able students labelled everything, while the less able left the drawing unlabelled. Individual areas which were answered poorly included unspecified types of switch and shoot buttons with no details. There continues to be a problem with the same solutions being offered within both ideas, and candidates stating generic components and materials.

Question 3 (b)

Evaluations were again dependant on the ability of the student but not always detailed enough to gain credit.

Question 4 (a) Mean Score – 2.53 from 6 marks

Most candidates failed to correctly distinguish the difference between Need, Environmental Considerations and Quality. Generally the majority of students did not gain the full marks available because they failed to justify their reasoning.

Question 4 (b) Mean Score – 0.26 from 2 marks

Most candidates stated that steel is durable, and that it does not rust!

Question 4 (c) Mean Score – 0.43 from 2 marks

There were a wide variety of responses to this question, but few correctly identified reasons why injection moulding is a suitable process.

Question 4 (d) Mean Score – 1.52 from 4 marks

Many candidates identified copper as a good conductor enabling current to flow easily, but many thought it cheap.

Question 4 (e) Mean Score – 0.77 from 2 marks

Many incorrect responses related to safety checks, or checks not related to electronics, e.g. aesthetics.

Question 4 (f) Mean Score – 0.42 from 2 marks

Few candidates gave sufficiently detailed or accurate responses to receive marks.

Question 4 (g) Mean Score – 1.85 from 4 marks

Most candidates achieved two marks for stating their response, but few achieved the additional marks for any form of explanation.

GCSE Design and Technology: Systems & Control Technology
Principal Examiner's Report - June 2009
1974, Higher Paper 2H

General Comments

Evidence indicates that candidates were entered at the correct tier. Candidate responses show a clear improvement on previous years, resulting in higher marks being awarded across all parts of the paper.

These comments should be read in conjunction with the question papers and the published mark schemes.

Higher Paper

Question 1(a) Mean Score – 3.09 from 6 marks

There are still a disturbing number of candidates who simply repeated the specification points given in the stem of the question. Many rephrased the point or reason given, e.g. "Can be recycled so it can be used again" or explained the point rather than providing a reason gaining a single mark only.

Good examples included:

- "It must have a strong easily mounted bracket so it can be securely fixed in place."
- "It must be waterproof with tight seals to prevent rain water entering and shorting the circuit inside."

Many more candidates than last year understood environmental considerations, for example:

- "It must be made from recyclable materials to save resources and reduce landfill"
- "It must switch off after a limited time to save the energy from the solar panels for next time"

But there were still some who lost marks by discussing non-environmental considerations in this section.

Question 1 (b) Mean Score – 0.32 from 2 marks

Candidates could not clearly identify two reasons for using steel. Far too many think that steel does not rust. The word 'strong' on its own is too vague to be awarded a mark.

Question 1 (c) Mean Score – 0.93 from 2 marks

Most candidates could give a reason for injection moulding being suitable.

Question 1 (d) Mean Score – 2.42 from 4 marks

Most candidates could give properties of copper, although a large group said copper is a low cost material.

Question 1 (e) Mean Score – 0.9 from 2 marks

Many candidates could describe quality control checks well.

Question 1 (f) Mean Score – 0.89 from 2 marks

Many candidates could good comments on the suitability of the shape for vacuum forming

Question 1 (g) Mean Score – 2.69 from 4 marks

Most candidates could comment on how the light could illuminate a wide area. Fewer could comment on how the solar panel and rechargeable batteries avoided the requirement for mains electricity.

Question 2(a)(i) Mean Score – 1.44 from 2 marks

Most candidates could complete the truth table accurately.

Question 2(a)(ii) Mean Score – 1.65 from 2 marks

Most candidates could complete the graph accurately.

Question 2(b)(i) Mean Score – 1.82 from 3 marks

Candidates were asked to name these components, so the responses R1, VR1 and C1 were inaccurate.

Question 2(b)(ii) Mean Score – 1.73 from 2 marks

Most candidates could describe how the frequency could be changed.

Question 2(c) Mean Score – 0.77 from 2 marks

Responses to this question varied in quality. Many candidates failed to offer the depth of response needed for a 'describe' question and failed to gain the second mark.

Question 2(d) Mean Score – 1.16 from 3 marks

Most candidates could give one or two reasons for prototyping a circuit/product.

Question 2(e) Mean Score – 0.75 from 2 marks

Many candidates provided a one mark description of using CAD/CAM.

Question 2(f) Mean Score – 0.69 from 2 marks

The most frequent incorrect response to this question was 'more accurate'.

Question 2(g) Mean Score – 1.12 from 2 marks

Most candidates could explain how to send a file electronically via an e-mail, while some achieved the second mark by saying the file would be an attachment.

Question 2(h) Mean Score – 1.01 from 2 marks

Many candidates could identify how sales were recorded by EPOS, yet descriptions of how the manufacturer could use this data were limited.

Question 3 Mean Score – 12.3 from 22 marks

Question 3 (a)

This question is well understood now and many candidates are now offering good quality ideas for design idea 2 as well as idea 1. However, some students are still unable to name specific sensing components, and generic terms are still frequently used. Centres may wish to share model responses to these questions with candidates.

Weaker candidates often repeated features in both designs, especially LEDs. Complete repeats were rarer except amongst those with very limited answers in design 1. Many included extra features for which there were no marks. There were too many generic sensors.

There were more designs with achieving either full marks or seven out of eight than previous years and a pleasing number who clearly set out the answers to each specification stating what was used and how.

Many solutions employed industrial Velcro, spring-loaded clamps and named glues but no locking nuts. Although LEDs prevailed, there were also motorised flags, 7 segment displays and accurately named filament bulbs.

Flashing, brighter output, colour changes and audible outputs were included in the 'more noticeable' section although quite a few used flashing LEDs to start with and then added nothing to make them more noticeable. Most could name a suitable plastic and batch production method, but more repetition were found in this section along with many responses which simply did address this specification point.

Question 3 (b)

There were more genuine evaluations this year than ever before, although credit was also given for explanations as well as in-depth evaluative comments. However, many candidates gave very detailed evaluation of one point for one mark and failed to address the second.

Question 4(a) (i) Mean Score – 0.73 from 2 marks
Question 4 (a) (ii) Mean Score – 0.46 from 2 marks

A significant number of students could not describe the function of a thermistor and its need to be reset.

Question 4 (a) (iii) Mean Score – 0.51 from 2 marks
Question 4 (a) (iv) Mean Score – 0.73 from 2 marks

The quality of mathematical skill was very limited, which was also the case for part iv. This should be addressed in the teaching of electronics.

Question 4 (b) (ii) Mean Score – 0.33 from 2 marks

The number of candidates showing an understanding of op-amps were in the minority.

Question 4 (c) Mean Score – 0.73 from 3 marks

Most students struggled to identify advantages to *society* of employing CAD/CAM.

Question 4 (d) Mean Score – 1.16 from 2 marks

Most students could identify how to improve waste management, although few could describe the use of sustainable technology in mobile phones. Responses for part (i) were often repeated in part (ii).

Question 4 (e) Mean Score – 1.97 from 4 marks

Most candidates could answer this question and gain two marks out of the four available. There were many well explained benefits, however, many candidates went on to merely rephrase their response for part (ii). Some candidates misread the question and described benefits to the manufacturer or environment rather than the consumer.

GCSE Design and Technology: Systems & Control Technology
Principal Examiners' Report - June 2009
1974, Foundation Paper 3F

General Comments

This is the seventh year that this specification has been examined. The specification tests candidates' knowledge and understanding of mechanisms, materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in school and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack in depth and detail in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide to direct what must be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed well where questions were targeted at school workshop production but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers, although there is some evidence to suggest that this is starting to improve and notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Foundation Tier (3F)

Most candidates showed a range of experiences throughout the paper and as a result could score some marks across all the questions. There were some obvious areas of materials and processes that were not covered by some centres which penalised their candidates.

There was no evidence to suggest that candidates had been entered for the wrong tiers this year and centres are demonstrating increasing expertise in preparing candidates for questions. There was also no evidence of centres or candidates misunderstanding the instructions. Candidates made responses to all questions suggesting that the length of the paper is correct. It was obvious that some areas of the specification are not being taught to candidates in centres and as a result some centres disadvantaged their candidates. A similar criticism can be made, as it is evident that some centres are not teaching candidates about the properties of materials and the correct associated terminology rather than general generic

statements such as ‘strong’. The design question was either well understood by candidates or there was very little evidence that candidates could produce two different ideas rather that one idea developed. In many cases, candidates failed to identify different materials or processes and subsequently lost marks. A large proportion of candidates scored well but many were unable to make a reasonable attempt to evaluate their design in part b. Question 4 was well answered and it is evident that centres are preparing candidates for product analysis reasonably thoroughly.

Question 1

This question is now very familiar and on the whole it was answered well with most candidates being able to name most of the items shown and they were able to describe their use.

Question 1(a) Mean Score – 5.09 from 10 marks

Most candidates could name the items correctly but the tap and lathe caused the most problems. There were varying descriptions of the lathe.

Question 1(b)(i) Mean Score – 0.51 from 1 mark

A good number candidates were able select electro-plating as the correct finish.

Question 1(b)(ii) Mean Score – 0.63 from 2 marks

A good number of correct responses seen but too many candidates use the term ‘strong’.

Question 1(b)(iii) Mean Score – 0.30 from 2 marks

This question was poorly understood with many candidates being confused by the question.

Question 1(c)(i) Mean Score – 0.69 from 1 mark

Very well done by the large majority of candidates.

Question 1(c)(ii) Mean Score – 0.23 from 1 mark

A mixed set of responses from candidates.

Question 1(d) Mean Score – 0.75 from 2 marks

Well done by the majority of candidates, gaining at least one mark, with e-mail as the most popular answer.

Question 1(e) Mean Score – 0.11 from 3 marks

Poorly done by a large number with far too many candidates making generic statements about the benefits of CAD/CAM.

Question 2(a)(i) Mean Score – 2.04 from 3 marks

Generally most candidates scored well on this part question.

Question 2(a)(ii) Mean Score – 0.39 from 1 mark

Again a popular question on which stronger candidates scored well.

Question 2(b) Mean Score – 0.80 from 2 marks

A good set of responses with most candidates securing at least 1 mark mainly related to 'less friction'.

Question 2(c) Mean Score – 0.52 from 2 marks

A mixed set of response on this part question, although many secured at least one of the two marks.

Question 2(d) Mean Score – 0.88 from 1 mark

A popular question in which most candidates scored well.

Question 2(e) Mean Score – 1.16 from 2 marks

Most candidates scored at least 1 mark.

Question 2(f) Mean Score – 1.04 from 2 marks

Generally most candidates scored well on this part question for just one mark with 'last longer' as the most popular response.

Question 2(g) Mean Score – 0.86 from 2 marks

This question was found confusing by many candidates who took the wrong focus and emphasis.

Question 2(h) Mean Score – 1.46 from 3 marks

Generally most candidates scored well on this part question.

Question 2(i) Mean Score – 0.79 from 2 marks

This question was well done by the majority of candidates for one mark relating to personal injury.

Question 2(j) Mean Score – 0.48 from 2 marks

Many candidates gave one moral issue, but few where able to give a second.

Question 3 Mean Score – 3.86 from 22 marks

Question 3(a)

Most candidates scored poorly on this question this year. Ideas were poor and lacked technical detail and understanding with many failing to understand what type of mechanism would be required to carry out such a movement. The second design idea when presented often showed little difference from the first proposal.

Question 3(b)

Many candidates did not evaluate their design proposals, merely repeating what the point for originally. Few candidates took the point into more detail to score the marks available.

Question 4 (a) Mean Score – 2.79 from 6 marks

Many candidates were better prepared for this question this year. The needs of the user and quality headings caused the most problems for candidates. The environment section on the whole was the better attempted section.

Question 4 (b) Mean Score – 0.38 from 2 marks

Hard and tough were the most commonly seen responses here and some candidates scored well on this question but too many responses simply listed 'strong'.

Question 4(c) Mean Score – 0.55 from 2 marks

This part question was reasonably done by some candidates with 'accurate' and 'smooth' as the two most common responses given.

Question 4(d) Mean Score – 0.66 from 4 marks

A poor set of responses on the whole with candidates understanding of properties being disappointing.

Question 4(e) Mean Score – 0.45 from 2 marks

Many responses here lacked focus to the screw thread and were too generic to be able to be awarded any marks.

Question 4(f) Mean Score – 0.39 from 2 marks

Poorly done on the whole by the large majority of candidates who all failed to acknowledge any detail or points relating to the process.

Question 4(g) Mean Score – 2.00 from 4 marks

A good number of candidates scored well here in both sections but especially so in the first part.

GCSE Design and Technology: Systems & Control Technology - Mechanisms
Principal Examiner's Report - June 2009
1974, Higher Paper 3H

General Comments

This is the seventh year that this specification has been examined. The specification tests candidates' knowledge and understanding of mechanisms, materials and products, processes and the effects of producing and using them on society and the environment. The written paper tests their application of this knowledge and understanding through their responses to questions about products and the processes involved in their manufacture, both in school and as part of large quantity production.

It remains the case that candidates' knowledge of processes continues to lack in depth and detail in order to be able to access the whole range of marks available on the paper. Candidates should be prepared for this examination using the specification as a guide to direct what must be taught. It is not sufficient to rely upon and assume that candidates will gain sufficient knowledge and understanding through practical designing and making in their coursework. Candidates have to be taught on a more formal basis, the contents of the specification.

Most candidates performed well where questions were targeted at school workshop production but where commercially produced products were introduced candidates showed limited knowledge. Where questions asked for an explanation or description candidates continue to give a reason and lose the second mark because they did not justify or qualify their answers, although there is some evidence to suggest that this is starting to improve and notice should be taken of the information in the Teacher's Guide (pages 11 to 15) that gives clear guidance as to the distinct meaning of the wording and word hierarchy used in questions for this examination i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Candidates must also be encouraged to use only the space provided for their responses.

It must be stressed to candidates that the question needs to be read carefully in order to score marks, without wasting too much time on responses that do not score marks.

Higher Tier 2H

It was evident that the majority of centres had entered candidates correctly for this tier of the examination. A number of candidates showed a greater understanding of what the key words in questions were asking of them i.e. give/ state/ name/ describe/ explain. This should form part of the teaching practice to students in preparation for this paper. Centres are also reminded that candidates must write in pen rather than pencil and that no correction fluid or pens should be used. Candidates must also be encouraged to use only the space provided for their responses.

Question 1(a) Mean Score – 3.10 from 6 marks

Many candidates were better prepared for this question this year. The needs of the user and quality headings caused the most problems for candidates. The environment section on the whole was the better attempted section.

Question 1(b) Mean Score – 0.72 from 2 marks

Hard and tough were the most commonly seen responses here and most candidates scored well on this question but too many responses simply listed 'strong'.

Question 1(c) Mean Score – 0.80 from 2 marks

This part question was good on the whole with accurate and smooth as the two most common responses given.

Question 1(d) Mean Score – 0.81 from 4 marks

A poor set of responses on the whole with candidates understanding of properties being disappointing.

Question 1(e) Mean Score – 1.07 from 2 marks

Reasonably well done on the higher tier, but many responses here lacked focus to the screw thread and were too generic to be able to be awarded any marks.

Question 1(f) Mean Score – 0.75 from 2 marks

Poorly done on the whole by the large majority of candidates who all failed to acknowledge any detail or points relating to the process.

Question 1(g) Mean Score – 3.23 from 4 marks

A good number of candidates scored well here in both sections but especially so in the first part.

Question 2(a)(i) Mean Score – 0.67 from 2 marks

Generally most candidates scored one mark on this part question.

Question 2(a)(ii) Mean Score – 1.36 from 2 marks

Generally most candidates scored well on this part question.

Question 2(b) Mean Score – 0.80 from 1 marks

Generally most candidates scored well on this part question.

Question 2(c) Mean Score – 0.43 from 2 marks

A good number of correct responses were seen, but too many steel and aluminum answers given.

Question 2(d) Mean Score – 2.34 from 4 marks

A good number of correct responses were seen for both the advantages and disadvantages of both steel and GRP.

Question 2(e) Mean Score – 1.16 from 2 marks

Some responses lacked relevance to the question which was about communication rather than CAD/CAM, but the majority picked up marks.

Question 2(f) Mean Score – 1.24 from 4 marks

Many good single responses were seen which were not then described and therefore could only score one of the two marks available for each described advantage.

Question 2(g) Mean Score – 2.33 from 3 marks

Most candidate scored well here for what was a well answered question on the whole.

Question 2(h) Mean Score – 0.74 from 2 marks

A very limited number of correct responses seen here. Most correct answers focused on 'saving money'.

Question 3 Mean Score – 12.3 from 22 marks

Question 3(a)

Most candidates scored well on this question this year. Ideas were generally clear and well annotated. The best designs showed clearly how the speed was to be reduced and rotated through 90^{o}.

The second design idea, in too many cases, often showed little difference from the first proposal, even down to naming the same material and using the same type of mechanism.

Question 3(b)

Many candidates did not evaluate their design proposals, merely repeating what the point asked e.g. my device would slow the speed down by 10 times. Few candidates took the point into more detail to score the marks available.

Question 4(a) Mean Score – 0.58 from 2 marks

This question was disappointingly done with candidates showing a very limited understanding.

Question 4(b) Mean Score – 1.11 from 2 marks

Most candidates scored one mark for stating that the screw thread was a temporary form of fixing without fully going onto explain their answer.

Question 4(c)(i) Mean Score – 0.75 from 4 marks

Poorly done on the whole suggesting candidates have a limited understanding of chains and sprockets.

Question 4(c)(ii) Mean Score – 0.47 from 1 marks

This part was well done by a good number of candidates.

Question 4(d) Mean Score – 1.53 from 2 marks

This part was well done by the majority of candidates although in some cases the numbers were given upside down as 18/54.

Question 4(e) Mean Score – 0.97 from 2 marks

Quite well done on the whole by a good number of candidates.

Question 4(f) Mean Score – 0.87 from 3 marks

A good number of candidates were able to score quite well on this part question, and this question was quite a good differentiator. The most frequent correct answers being related to cost and waste.

Question 4(g) Mean Score – 0.83 from 2 marks

Fewer workers required was the most popular answer here and a good number of candidates were able to secure at least one of the two marks available.

Questions 4(h) Mean Score – 1.63 from 4 marks

Well done by a good number of candidates but again in many cases not all responses were fully described therefore limiting the marks available.

GCSE Design and Technology: Systems & Control Technology
Principal Moderator's Report - June 2009
3974, Coursework Paper 01

A very small number of candidates were entered for this shortened course. In general marking was accurate.

It is difficult to consider writing any detailed report based on seeing the work of so few candidates, but the comments and recommendations made in the full course report are valid and can be applied here.

GCSE Design and Technology: Systems & Control Technology
Principal Moderator's Report - June 2009
3974, Higher Paper 2H

General Comments

It is very difficult to report on trends within the Short Course papers with so few candidates sitting these examinations. As the pattern of responses for 3974 reflected those for the 1974 papers, centres are advised to look at the Principle Examiners Feedback for the full course, 1974 2H.

n.b there were no entries on the Electronics foundation paper (2F) this year; nor was there an entry on either Mechanisms paper (3F and 3H).

GCSE DESIGN AND TECHNOLOGY: SYSTEMS AND CONTROL
(Full Course: 1974)

Grade Boundaries – June 2009

Overall Grades

The figures given below are the minimum subject marks required for each overall grade in the summer 2009 examinations.

All optional routes are out of 100 marks.

	A*	A	B	C	D	E	F	G
Electronics Foundation				53	42	31	21	11
Electronics Higher	82	71	60	50	40	35		
Mechanisms Foundation				49	40	31	23	15
Mechanisms Higher	80	69	58	48	37	31		

Component Marks

The figures given below are the minimum marks required for each component grade in the summer 2009 examination.

(Coursework 01 out of 102)
(Paper 2F & 2H out of 88)
(Paper 3F & 2H out of 88)

	A*	A	B	C	D	E	F	G
Coursework	92	80	68	56	45	34	23	12
2F				48	38	28	19	10
2H	64	55	46	37	29	25		
3F				43	35	27	20	13
3H	65	54	43	33	24	19		

GCSE DESIGN AND TECHNOLOGY: SYSTEMS AND CONTROL
(Short Course: 3974)

Grade Boundaries – June 2009

Overall Grades

The figures given below are the minimum subject marks required for each overall grade in the summer 2009 examinations.

Out of 100. There was only an entry for the Electronics Higher tier option this summer.

	A*	A	B	C	D	E	F	G
Electronics Higher	83	71	59	48	38	33		

Component Marks

The figures given below are the minimum marks required for each component grade in the summer 2009 examination.

(Coursework 01 out of 84)
(Paper 2F out of 44)
(Paper 2H out of 44)

	A*	A	B	C	D	E	F	G
Coursework	76	66	56	46	37	28	19	
Higher	31	26	21	17	13	11		

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