RECOGNISING ACHIEVEMENT

GCSE

Computing (Pilot)

General Certificate of Secondary Education **J275**

Examiners' Reports

June 2011

J275/R/11

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This report on the Examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the Examination.

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EXAMINERS' REPORTS

General Comments

The first full assessment of the new specification has been very encouraging indeed. Centres have shown much enthusiasm and skill in preparing candidates. Almost all the centres that submitted work this session had previously attended INSET sessions. This is evident in the quality of work.

In all the assessed material, the examiners were impressed with the overall quality of the work although at this stage it looks as if there are benefits to taking the full two years in which to prepare students. In some cases, where the attainment was more limited, there were signs that his was due to entry being made too early. This specification is intended to be taught over two years and candidates sometimes seemed not to have assimilated as much understanding of some programming concepts as they would if they had had the extra year.

Candidates have often responded well to learning material which is new to them and seem to be motivated by the inherent challenges. Clearly, many of them relish the opportunity to solve problems by writing programs.

The centres that submitted work were of widely diverse types, with academies, selective schools, comprehensives and independent schools all represented.

Controlled assessments

The controlled assessments worked very well. They discriminated well and there was a good spread of results. There was no general sign of the material in either of the controlled assessments being excessively difficult for the candidates. The work was mostly presented well and was easy to follow. Using the repository to submit work eased the moderation process.

The mark bands were designed to promote innovative approaches from candidates, such that a wide variety of solutions would be possible, for at least some of the tasks. This approach was also intended to avoid the difficulties and rigidity of "bean counting" marking approaches. Application of the mark bands was mostly successful, with very few adjustments being necessary.

A451 Computer Systems and Programming

General Comments:

This was the first summer session for this pilot qualification. Most candidates would have completed only 1 year of the two year course and this was reflected not only in the relatively small number of candidates (about 300) but also in the fact that while candidates appeared to be well prepared for some parts of the examination, they were not in others.

It should be emphasised that while many candidates for a subject such as computing are likely to be enthusiasts with considerable personal experience, there is a precise body of knowledge to be acquired in the course with elements which it is unlikely that most candidates will acquire elsewhere. Furthermore, the use of certain computing terms in everyday parlance is often imprecise (for example in not distinguishing clearly between a virus and spyware – which in question 8 for example, affect data security and privacy in different ways) and candidates are expected to have learnt the precise distinctions on the course. Therefore, as a general rule, it is not advisable to present candidates for the examination until they have studied the entire specification for this unit. Candidates appeared to be particularly weak as a whole on databases, networks and the internet, giving a strong impression that they were attempting to answer the questions as best they could from their own experience rather than from studying the course. (Perhaps not coincidentally, these topics are the last topics – other than programming – in the sequence of the topics presented in the specification).

Centres are advised to train their candidates in interpreting the action words in questions correctly, to make sure that they answer the question asked and can do so succinctly. Such action words include state (usually one mark per statement), describe (candidates need to answer with more detail than simply stating), explain (candidates should apply their knowledge to a situation) and justify (candidates should give reasons). These are general guidelines and candidates must read the questions carefully. For example "describe X" is very different from "describe the purpose of X" (although both require candidates to recall, with detail, material they have studied).

It must be said that where candidates did appear to have been prepared for the examination, the standard was generally high, and candidates and centres are to be commended.

Comments on Individual Questions:

Question 1

(a) This question was clearly aimed at the lower ability candidates, and was successful to the extent that most candidates obtained 2 or 3 marks out of 3. It was expected that these would be definitions that the candidates would have learnt and would be able to recall in the examination in a most basic way. Candidates who had not memorised a definition sometimes gave answers which missed important technical terms such as "data", stating for example that an input device is used to enter "stuff2 or "things" into the computer. Some of the most able candidates gave a far more in-depth explanation that was required, including examples etc… sometimes at the expense of answering the question and giving a definition. Centres should advise candidates that this is a single tier entry examination for grades ranging from A* to G, and will contain some questions which G grade students can answer. So some questions may well be as easy as they look.

(b) This question was quite well answered with a good proportion of the candidates gaining 5 or 6 marks out of 6, reflecting an accurate learning of the different types of storage device and their characteristics, as well as an ability to apply this understanding to given situations.

(c) While this question was intended to differentiate among students across the grade range, it was disappointing to see very few answers in the high mark band. Most candidate made valid points about how software that they were familiar with could be adapted to allow disabled users to access computers (for example, speech recognition enabling the use of microphones or screen enlargers) but it was clear that many candidates had simply not studied a wide range of accessibility devices. Centres should advise candidates that a banded response question is not necessarily an essay. Examiners are assessing as well as the response itself, how clearly it is communicated in terms of the organisation of the points in the question, language skills and the use of technical language. An introduction is not necessary (as this usually just repeats the question and does not communicate anything) and a conclusion is not needed either unless the question specifically asks for it (which was not the case here.

Question 2

(a) The use of the initials DBMS in the question was an indication that a mark could be gained for stating what DBMS stands for (which is also a valid description of what it is). Beyond that, only the more able candidates were able to give a correct description. Many candidates confused this with stock control software.

(b) The answers for this question were disappointing and suggested that candidates were unfamiliar with setting up forms and reports for a database. Centres should note that while it is possible in Microsoft Access (arguably the most common DBMS used in centres) to create a form object that displays a snapshot of data in the database, the specification uses the terms "form" and "report" in a more general sense – the form giving the ability to enter/alter data while the report gives a snapshot of the data which may be printed or just on-screen. It may be necessary for higher ability students to be able to make this distinction in order to gain full marks on a question like this.

(c) Both parts **(i)** and **(ii)** were generally well answered, most candidates showing an ability to interpret and to compose criteria for a query, using logic operations correctly. The few weaker candidates who did not get full marks often confused > with <.

Question 3

(a) Once again, because HTML was given as an abbreviation, there was a mark available for saying what this stands for… as this is of itself a description. However, although this question was aimed at medium to higher ability candidates, the responses were disappointing. To make the questions accessible, the question had been split into (i) describe html i.e. the code or convention itself, and (ii) its importance i.e. how it is used. This was not particularly useful for candidates described how html is used in part (i). These candidates were able to score marks under part (ii) for these correct answers. However, centres should train candidates to understand the response needed for common action words in questions such as "state", "describe" and explain. There were very few correct descriptions of HTML (which was very often confused with http) making it seem as if most candidates did not have an adequate understanding of html code.

(b) This question was aimed at lower ability students and most candidates answered correctly gaining all 5 marks. On this occasion the number of gaps to fill corresponded exactly with the number of file types offered, and many candidates made the assumption that this meant that each file type should be used once. On this occasion, this assumption was correct, but centres are advised that this may not always be the case – the number of options may not match the number of gaps and/or some options may be used more than once. Where a candidate had a wrong answer, this assumption sometimes induced them into further error as they tried to balance out the answers.

(c) This question was aimed at middle to higher ability students and only the strongest candidates obtained full marks. In part **(i)** it was necessary to answer within the context of the question which was compression for transmission over the internet, so that answers such as saving disk space were not relevant. Some candidates made valid points in part **(ii)**, taking their cue from the words "lossy" and "lossless" but some answers were very vague. For example, many candidates stated that lossy compression was achieved by getting rid of data that is not needed. The key learning which was being assessed was an understanding that in lossy compression, when the data is decompressed to be played back, some quality/detail would be lost (which may be imperceptible) but in lossless compression, it is essential that the data is reproduced exactly as it is. Candidates also attempted to give specific examples of file formats (and were given credit where these were correct) although it would have been sufficient to say that media files tend to be compressed using a lossy technique, whereas documents would use a lossless technique.

Question 4

Both parts of this question were generally well answered. A common error in part a, among the weaker candidates, was to give the truth table for NOT(A) (i.e. filled in the blanks with 1, 0 0). This may be because they were trying to do one stage at a time (this was evident in the script of other candidates who added other columns). Centres who teach this method should encourage candidates to add extra columns if they need to. A common mistake in part b was to draw a NOT gate with two inputs.

Question 5

(a) It was anticipated that most candidates will be able to answer this correctly, and this was indeed the case with most of the candidates receiving at least one of the 2 marks available. Centres should be careful to point out to students that commercial internet security suites tend to contain a range of anti-malware utilities such as antivirus, firewall, spyware remover, and to make sure that the candidates understands the different roles.

(b) This question was aimed at higher ability students and very few candidates were able to precisely describe what a defragmenter does (although a few more had a vague idea). Once again, some candidates deviated from describing a defragmenter (i.e. what it does) to justifying its use (i.e. why we need one).

Question 6

(a) This question was fairly well answered. While most middle and higher ability knew how to convert hex to denary and got both marks, most low ability candidates got this wrong or left it out. The sequence of questions assumed that candidates would have learnt how to do this conversion directly from base 16 to base 10 (i.e. 6 * 16 + 10 * 1). It was pleasing to see many candidates using a conversion to binary as their intermediary step, thus emphasising the core importance of hex in computing which is assessed later in part d. Centres are encouraged to take this approach, and this will be reflected when a question like this is set in future.

(b) & (c) This part was also answered generally well by middle and higher ability students, who tended to obtain both marks, while weaker students tended to obtain none. In part c, most candidates who only got one mark erroneously put C as the hex value for 13

(d) This question did not differentiate the highest ability students as was expected. Despite being quite able to do the conversions, most candidates only obtained one of the two marks. Sometimes this was due to not being able to express their answers clearly enough, and sometimes they were just wrong. For example some candidates suggested hex numbers take up less space in memory than their binary equivalents.

Question 7

(a) Most candidates obtained full marks in part **(i)** although it is important to point out that although the question clearly stated that there were **two** variables, a few candidates gave only one variable.

Only the more able candidates tended to obtain both marks in part **(ii)**. This was largely due to the fact that many candidates gave vague answers such as "a constant cannot change but a variable can"

(b) This was intended to be a relatively easy question aimed at lower ability candidates but only about half of the candidates knew the answer and obtained both marks, and the others did not know and got no marks. On the positive note, it was noted that in this question as in **7(a)(ii)**, candidates were clearly attempting to make a positive statement about each item when comparing or stating differences between two terms.

Question 8

This second banded level response question was more conceptually more difficult than the first and this was reflected in the answers with only about 5% of candidates providing a high level answer. There were some points to be made which were accessible to all students (such as firewalls and passwords) but many other points required that the candidate have studied and revised network security measures as required by the specification. In questions like this, it is helpful for candidates to ensure that they refer to the question to ensure that they have addressed it fully. In this question, it was significant that the company had a relatively large number of employees and that the computers were located on one site, but this was rarely picked up by candidates. Similarly the questions asks for measures **and** policies to safeguard security **and** privacy and these could have been used by the stronger candidates as scaffolding to ensure that their responses are well structures as required for a top band answer.

Question 9

The algorithm question in this paper is designed so that the weaker candidates can access some of the marks, but only the more able would get full marks. In this case, for example, there was a very easy mark for inputting the age of the dog, and a relatively easy mark for checking if the age was less than or equal to 2.

As it turned out, a quarter of candidates obtained no mark for this question, many of them not having attempted it at all. Centres are advised to teach candidates to seek out and attempt elements of these questions which are more accessible. This will in turn encourage them to carry on to the more challenging parts of the algorithm.

With candidates who made a good attempt at the question, common errors included writing down the wrong inequality sign. Some candidates also misunderstood the third bullet point question to mean "if the age is 2 years more" instead of "if the age is more than 2"

A452 Practical Investigation

The tasks in this unit are intended to be a mixture of technical problem solving as well as open ended commentaries on the implications of the scenarios. This allows for much flexibility of approach with the opportunity for innovative solutions. For many of the tasks, there are no "right answers" but a challenge to go beyond the specification.

There was a limited entry for this unit in this session and most centres appear to be planning to complete the tasks at the end of a two year course.

The assessments were mostly realistic, which suggests that the criteria are well understood and centres have had no obvious difficulty in applying them.

There were more attempts at the Javascript assignment than the LMC but in each case, the standard of work was generally encouraging. The centres that submitted work this year may be self selecting in terms of quality, but it seems that candidates are encountering no special difficulties from the specification requirements. In particular, the low level coding was mostly managed well, in some cases, outstandingly so.

The flexibility that we allowed in the presentation of this module has caused no problems, allowing centres and candidates freedom to follow approaches that work for them.

The technical aspects of the assignments discriminated well, but often the best candidates were characterised by intelligent and perceptive comments about real-life implications of the scenarios.

A453 Programming Project

There was a limited entry for this unit and most centres appear to be planning to complete the coding tasks at the end of a two year course.

The work submitted was generally very realistically assessed with some good coding evident from many of the candidates.

VB and VBA appear to be the common choice for centres who submitted work and these tended to be able to provide the features need to develop suitable solutions.

Centres generally provided the necessary electronic evidence of the solutions to enable the moderator to look at the solution but please note many of the images prepared by the candidates for their solutions were linked to their home drives on the school computer systems and could not be checked by the moderator. While this did not present a problem for those centres who did this, it is worth noting that this may be an issue in the future when the candidate is relying on the electronic evidence.

Good quality, detailed algorithms were evident in the work of the highest scoring candidates as was careful testing to try to break the system in order to identify how robust the code was. Knowing and identifying the limitations of the system will provide excellent evidence of testing and contribute to the evaluation of the solution, it will rarely detract from the validity of a working solution.

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