Version 1.0: 0709

ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate in Education

Computing 2510

COMP2 Computer Components, The Stored Program Concept and The Internet

Report on the Examination

2009 examination – June series

Further copies of this Report are available to download from the AQA Website: www.aqa.org.uk

Set and published by the Assessment and Qualifications Alliance.

The Assessment and Qualifications Alliance (AQA) is a company limited by guarantee registered in England and Wales (company number 3644723) and a registered charity (registered charity number 1073334). Registered address: AQA, Devas Street, Manchester M15 6EX
Dr Michael Cresswell Director General.

General

This was the second time that COMP2 had been examined. Many candidates demonstrated a good understanding of the topics featured in the question paper. In particular, candidates seem to have taken well to the new topic of logic circuits and, to a lesser extent, Boolean algebra. Candidates need to be more precise in their use of technical terms. Too often responses were given that might be acceptable in a conversation with friends about computing but which were not creditworthy in an AS examination.

Question 1

Some candidates provided an accurate technical definition that a peripheral is a device that is not part of the CPU. A more frequently seen response that was also allowed was that a peripheral was an external device. Responses indicating that peripherals were devices which plugged into or connected to a computer did not gain credit as this description could be applied to the processor and main memory. Candidates also need to make clear that peripherals are devices. The most common misconception was that all peripherals were designed for user interaction.

The overwhelming majority of candidates correctly identified a mouse as an input device and a laser printer as an output device. A small number classified a laser printer as being an input/output device. This did not gain credit as, whilst it is true that most printers provide feedback to the computer, devices are classified by their primary function.

Question 2

The responses to this question were similar to those made on the same topic in January 2009. Most candidates were aware that an assembler is required to translate assembly code into machine code. Fewer candidates knew that a compiler translates a high level language statement into machine code. An interpreter will not produce machine code; it merely interprets and executes high level language statements.

Question 3

This is a new topic and it was poorly understood. Only a small minority of candidates were able to explain that in a declarative language a program specifies what the problem to be solved is, rather that what steps should be taken to solve the problem. The most popular incorrect response was that it was a language where variables had to be declared before they could be used. An even smaller number of candidates were able to give an example of a type of application for which a declarative language might be used. Most who were able to do this referred to either artificial intelligence directly or an application which would use artificial intelligence. References to SQL as an example application were not sufficient to gain credit as SQL is a language not an application.

Question 4

Some candidates correctly identified the truth table as representing the NOR logic gate, but there was a wide range of different responses to this question part.

The logic circuit question was well answered with many candidates getting two or three of the three available marks. Most realised that it was not necessary to NOT the A and AND it with B, although candidates were not penalised if they did this. Diagrams were usually drawn clearly.

Many candidates were able to state a correct Boolean expression that represented the logic circuit. Some introduced unnecessary brackets into the expression, but these were not penalised if they did not affect the expression's logic.

Most candidates attempted to simplify the Boolean expression by applying the laws of Boolean algebra. A smaller number constructed a truth table which was also acceptable. When using the former method, many candidates recognised that the first step was to apply DeMorgan's laws to the left hand part of the term, but fewer knew what to do after this step had been completed.

The most common mistake was to assume that $\overline{\overline{A} + \overline{B}} = \overline{\overline{A}} + \overline{\overline{B}} = A + B$ rather than applying De Morgan's laws. Candidates need to ensure that they explicitly show all stages of their working out. A number of candidates scored a mark for having the correct final answer and for the application of De Morgan's law, but lost a mark for not making the other steps in the simplification clear.

Candidates who produce truth table solutions to this type of question must ensure that they state the simplified expression at the end of their solution. A few produced an accurate truth table, but failed to state the resulting expression.

Question 5

Candidates were better able to explain the purpose of system software than of application software, although some of the explanations of system software that did gain credit were quite superficial and only just worth a mark. System software is software that is required to manage the operation of the hardware. Application software was often poorly explained. It is software that allows the user to complete user-oriented tasks which the user would want to do regardless of whether they had a computer or not. All software performs tasks.

Many good examples of types of system software were given, most commonly the operating system and library programs. The most frequently seen error was to give examples of utility programs such as a disk defragmenter when the question had specifically asked for types other than utilities.

Question 6

This question was very well answered, with many candidates scoring full marks. The key to answering this type of question successfully is to identify the address bus (as it is uni-directional) and the processor (as it the only device that outputs onto the address bus).

Question 7

The best answers to this question were given by candidates who had learned the register transfer notation for the fetch-execute cycle and could therefore describe each step concisely and unambiguously. Some good answers were written as prose but candidates who took this approach often lost marks through either lack of understanding or inaccurate expression.

The most common misconceptions were in steps 2b and 4. During step 2b, the contents of the memory address stored in the MAR are fetched from the main memory into the MBR. The contents of the MAR are not simply transferred into the MBR. During step 4 it is the contents of the CIR that are decoded, not the CIR itself. As in January, many candidates attributed the CIR with the ability to do the decoding instead of realising that the CIR simply holds the instruction whilst it is decoded.

It was pleasing to see that many candidates understood that increasing the width of the data bus would enable more data to be transferred at one time. In contrast, only a small number of candidates understood that increasing the width of the address bus would increase the amount of addressable memory. Many mistakenly believed that it would allow multiple addresses to be sent simultaneously. Candidates appreciated that increasing the clock speed would speed the computer up, but many failed to explain that this would be because instructions could be executed more quickly so failed to gain credit.

Question 8

The Data Protection Act defines Personal Data as, ‘Data which relate to a living individual who can be identified ... from those data.’ Many candidates had clearly learned this definition and were able to state it accurately. Some, however, gave very general answers such as, 'data about a person,’ or, ‘data that people would not want others to know,’ that were not worthy of credit.

Many candidates were able to state a principle of the Act that could be met through careful design of the program. The most frequently cited principles were that data should be kept securely and that data must be kept up to date. Some candidates mistakenly stated measures such as password protection or backing up data, rather than principles. Most candidates who were able to state a principle of the Act were able to identify an appropriate measure to ensure the principle was met and explain how this occurred.

Some candidates had learned short phrases to help them remember principles such as Quality, Lifetime and Security, but stating these alone was insufficient. Quite a lot of candidates held the mistaken belief that data could not be given out to anyone.

Question 9

The vast majority of candidates understood that Cascading Style Sheets (CSS) are used to determine how the different components of a web page will look. Fewer were able to explain that HTML would be used to specify from what components a page is made.

Some candidates understood that body, h1 and p are type selectors. Candidates need to know the formal structure of CSS commands as well as having practical experience of using CSS.

The correct CSS statement that candidates were required to write was
p { color : green; font : bold }. Most candidates realised that they needed to copy the first part of the statement from the existing style sheet. We accepted a variety of alternative statements that

were not perfectly syntactically correct as alternatives to font : bold, but candidates need to be aware that in the future we are likely to require precise use of the correct syntax. Answers that included statements that looked like HTML tags did not gain credit.

Question 10

This question was poorly answered. Many candidates simply stated that the Internet and an intranet were both networks, which was not enough to gain credit. Valid similarities included the use of common protocols and provision of access to similar services. A mistaken belief,widely held, was that an intranet would only be available on a LAN or within a small area. Candidates may form this opinion based on their own practical experiences of a college intranet, but large companies have global intranets that can be accessed worldwide. Many candidates lost marks by only stating one side of a difference, such as that an intranet was private, without making clear that they understood that in contrast the Internet was publicly accessible.

Most candidates were able to give a definition of a protocol or to describe one in sufficient detail to be worthy of credit. Some gave examples of protocols, which by themselves were not creditworthy.

There were a lot of very good responses to the question about the TCP/IP protocol stack. Many candidates were able to name two stack layers and to give examples of layer functions. The most common errors were to name the Transport layer as the Transfer layer and the Data Link layer as the Data layer.

Question 11

Most candidates understood that the purpose of DRM was to control access to digital media, so as to prevent piracy. Fewer went on to explain that this was done to enforce copyright legislation and to ensure that artists received the income from music sales. Some errantly believed that DRM was a law or a company.

Many candidates were able to explain at least one method of applying DRM, the most common descriptions being of encryption or limiting playback to a particular hardware device or piece of proprietary software. A common, but incorrect response was that DRM could stop the music files being copied, whereas DRM is unlikely to be able to do this. Rather, if the files are copied they could not be played. Some candidates mistakenly continued with their descriptions of why DRM was used or gave advantages and disadvantages of it, rather than explaining how DRM would work. Encryption and encoding are not the same things, nor are a key and a code or password.

Question 12

Some candidates provided good descriptions of two differences between primary and secondary storage, but, the majority failed to score any marks and a significant number clearly had no idea what the terms meant. The most common acceptable response was that primary store was volatile whereas secondary store was non-volatile. Some candidates gave the opposing side of the same point for each response and were therefore only able to gain one mark.

It is not true that secondary storage is always external or removable; nor is it universally the case that secondary storage devices have a higher storage capacity than primary storage. A CD-ROM or flash memory device may well have a storage capacity smaller than the primary store in the computer in which it is being used. To ensure that credit is gained, candidates need to make sure that differences are universally true, not just true in some specific cases.

The level of detail in descriptions of the principles of operation of a hard disk drive was limited. Many candidates described characteristics such as typical capacities and uses rather than principles of operation. Most candidates expressed themselves fluently so the general quality of language was good. However, candidates often lost marks because they could not use technical terms such as sector or platter precisely. Many candidates used the term needle instead of read/write head. The most common misconception was that a laser was used to read/write data. Even candidates who described the medium as being magnetic sometimes referred to pits on the disk or the use of a laser.

Mark ranges and award of grades

Grade boundaries and cumulative percentage grades are available on the **Results Statistics** page of the AQA Website.