



General Certificate in Education

Computing 2510

**COMP2 Computer Components, The
Stored Program Concept and The
Internet**

Report on the Examination

2010 examination – January series

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Question 1

Part (a) was very successfully answered. The vast majority of candidates could distinguish between an IP address, Domain Name and URL and gained full marks. Only a handful of candidates failed to score any marks.

For part (b) many candidates had some idea what a Domain Name Server (DNS) did but often described this poorly. The majority simply stated that it stored the appropriate URL and IP address combinations and left it at that, they did not go on to mention its active role in translating the URL into an IP address. Common incorrect answers were of the form that the Domain Name is easier to remember than an IP address. There was also a lot of confusion about the DNS being the preferred way of ensuring all web servers etc. had a unique URL so servers would be able to find requested sites i.e. candidates were describing Domain Name Registration services.

Question 2

This question was tackled using either truth tables or the laws of Boolean algebra, with the number of candidates using each method being approximately equal. Candidates who used the truth table method appeared to make fewer errors. Many candidates showed the correct steps, using either method, but then failed to state the final answer explicitly. Candidates using the rules of Boolean algebra often made the first step by applying De Morgan's law, but then ground to a halt. It would appear that Boolean algebra is still a topic that candidates find difficult. Often candidates would reach $A \text{ OR } \text{NOT } A$ and then make these terms completely disappear instead of equating them to '1'. Care was needed with the answer as moving the terms around to simplify it often resulted in transposition errors which lead to the wrong answer. There were many false starts with answers crossed out and the whole answer being rewritten.

Question 3

For part (a) the vast majority of candidates were able to name two registers that were involved in the fetch part of the fetch-execute cycle, and overall a wide range of the possible answers were given. A minority of candidates gave acronyms such as MAR and so failed to gain credit. Some candidates clearly knew the correct acronyms and tried unsuccessfully to invent or recall a corresponding full name, e.g. "Memory Bus Register", "Memory Access Register".

For part (b) candidates often attempted to describe what was happening in steps 1 and 2b without explaining the role of the two buses and main memory, which is what had been asked for. Very often candidates confused the roles of the data and address buses. There were many references to bidirectional data buses and unidirectional address buses but this did not answer the question that had been asked. Candidates often stated that the memory was moved rather than the "contents of" a specific location or its equivalent description. Also fairly common as a wrong answer was the fact that the address bus carried data from place to place.

Responses to part (c) were better than those to part (b). Nevertheless many candidates did not realise that the two processes are independent of each other. A very common wrong answer was that the buses are bi-directional and so allow two things to happen in opposite directions simultaneously. The idea that the steps 2a and 2b occur in different components was better known but often very vaguely stated. Candidates sometimes talked themselves out of a mark by stating the processes happen in different registers and different buses.

Question 4

Many candidates answered the question that they would like to have been asked about compilers and interpreters, rather than the question that was actually asked. Responses were often no more than repetition of bookwork about how compilers and interpreters work and showed little understanding.

Responses to part (a) usually described the process of compilation, not why the compiler had been used by the software company. Answers often compared compilers and interpreters regarding their role at finding program errors – this is not what the question was asking. Nevertheless, some candidates tackled the question well, gaining full marks in this part.

Part (b) was also answered with reference to what an interpreter does regarding how it is easier to spot and correct errors, missing the point of the question entirely. A small but significant portion of the answers were left entirely blank suggesting that the topic was not well known by the candidates. A common incorrect answer was that "the interpreter allowed a script to download line by line so that it could run line by line immediately rather than having to wait for a full compilation to download and then execute". Correct responses identified that interpreted code could be run on any type of processor which is important when programs are run in a browser as the program authors could not know what type of processor the end user would have.

Question 5

Subpart (a) (i) asked candidates to identify the opcode and operand in an assembly language instruction. Surprisingly slightly less than half of candidates gave the correct answer. Despite being given the two options to choose from, some candidates wrote in different words and even binary numbers.

A register is a storage location that is inside the processor. For subpart (a) (ii), many candidates stated that it was a memory location but then did not go on to add "in the processor" or another equivalent correct statement. Answers often mentioned a storage location in the CPU. This is the final time the term CPU will be accepted as an alternative to processor. Traditionally, the term CPU refers to processor plus main memory so it is not accurate to refer to a register as a storage location in the CPU. Vague answers such as "where data can be temporarily stored" were also common. A register was often confused with the operating system registry and answered accordingly.

Part (b) was on the whole well answered and, for able candidates, it was a very easy three marks. This was not a difficult question as candidates had been given an example in the stem of the question. However, many candidates gave from four to six program statements. Others also placed #s in the answers which was not required. Under this specification, candidates are not expected to be aware of the different addressing modes. Other candidates lost marks by giving the opcode two or even three operands.

Question 6

This question was very well answered with many candidates gaining full marks. The use of language was mostly very good, although often the actual quality of the handwriting left much to be desired. There was also some confusion between special purpose and bespoke software types. The part relating to bespoke application programs was sometimes vaguely answered with poor examples that were special purpose examples such as payroll accounting or tax planning programs. A common way of missing a mark was to state the example as a brand name rather than a generic name. Finally there is still some confusion as to what an

application package is. Utility and library software were often given, inappropriately, as one of the types.

Question 7

The majority of candidates answered part (a) very well. It would seem that, given a logic gate diagram and a truth table made it quite easy for the candidates to answer when compared with Question 2 on Boolean algebra.

Part (b) was also well answered. The gates that could be replaced were usually correctly stated, however AND and NOR and NOT and OR sometimes appeared incorrectly. It was obvious from the answers that most candidates could convert the AND gate followed by a NOT gate into a NAND gate.

Part (c) was weakly answered even though there was a wide range of potential answers for a single mark. Where candidates went wrong was in giving answers about "making it easier for humans to understand and /or interpret". Reducing the number of gates would reduce the propagation delay, thus speeding up processing. It could also reduce power consumption and the cost of manufacturing the circuit.

Question 8

Answers often fell short of that required. A substantial proportion of answers simply stated "a rule" or "a set of rules". The former is not enough and this year "a set of rules" was accepted but the answer should really go on to say for data communication/exchange.

Part (b) required candidates to identify the appropriate protocol for various types of communication. Of the four subparts to this question the subparts (iii) and (iv) were those that were answered correctly most frequently. However sometimes for subpart (iv) SHTTP appeared rather than HTTPS. Incorrect answers often stated the layer rather than the appropriate protocol in the answer box. This question had answers ranging from four to zero marks and as such represents a good discriminator. A small but significant number of candidates left the entire answer blank.

Question 9

This question was often answered by describing the entire system including the database lookup and printing the till roll which was clearly not what the question was asking. Candidates should read the question carefully before starting to answer. The question was quite clear in that it asked about the bar code reader and even gave an end point to the process stating, "excluding the use of the check digit." Many answers concerned general stock control and automatic ordering systems which are more of an ICT-type answer than one expected from Computing candidates. A good number of candidates thought that the reader played some role in the security system somehow switching off RFID tags in the goods that were being scanned. At the other extreme, there were also many answers gaining full marks for very cogent descriptions.

Part (b) was answered quite weakly and approximately 15% of candidates did not attempt to answer it at all. Where the question was answered it was often incorrect with candidates believing that the check digit was the whole of the printed number below the bar code and its purpose was to allow the cashier to enter the number if the bar code had not scanned correctly. The check digit is in fact used to validate the input of the bar code. The idea of deactivating RFID tags also appeared here quite often.

Part (c) was answered correctly by the vast majority of students.

Question 10

Part (a) on HTML was a question that was well answered. Marks were lost mainly through carelessness and by candidates being untidy. Candidates need to ensure that heading style (H1) text is clearly larger than the body text. Line spacing was often unclear so it was difficult to be sure where candidates thought there should and should not be a blank line. Some candidates made their answers clearer by adding labels explaining the web page diagram, but this was the exception rather than the rule. Candidates should be advised that labelling is important because it makes candidates' intentions clear to examiners. Very few candidates made reference to the hypertext link to the named web page often just stating that the underlined word "optically" was a hyperlink but not stating to what. Just using a ruler to either measure or line up the various lines of text would have improved many answers.

In subpart (b) (i) most candidates identified that the background would be yellow. However the mark was often missed as candidates failed to state that it would be the background of the whole page that changed. Answers often simply stated the background changed to yellow which was not enough.

Many incorrect answers were seen to subpart (b) (ii). Candidates failed to note that the "dark" style was not used in the webpage and so this style rule would have no impact on the appearance of the page.

Subpart (b) (iii) was answered correctly by almost all candidates. Stating that the header was changed rather than the heading was the most common reason for missing the mark.

Question 11

Part (a) was about legislation. Candidates often gained full marks. The most common incorrect answer was the Data Protection Act in subparts (i) and (ii). Again some candidates appeared to be answering questions set in the previous year's paper. Small errors in the name of the legislation were ignored which did make it easier to obtain the marks in these components. Subpart (iii) was the one that was most often left blank.

Part (b) was about a Code of Conduct. Subpart (i) challenged the candidates' ability to explain / describe what was expected. It was often clearly stated that a Code of Conduct was a set of rules but the need for employees to follow it or be bound by it was less frequently stated and so this point was lost. Very rarely did candidates mention that this was a documenta contract (written document) and that its contents did not necessarily constitute a legal requirement. Subpart (ii) was answered in much vaguer terms than (i). The most frequently seen correct answer concerned the ability of the company to take disciplinary action against employees who had signed the code of conduct.