

CARIBBEAN EXAMINATIONS COUNCIL

**REPORT ON CANDIDATES' WORK IN THE
CARIBBEAN ADVANCED PROFICIENCY EXAMINATION
MAY/JUNE 2005**

INFORMATION TECHNOLOGY

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GENERAL COMMENTS

The number of candidates sitting this year's examination increased when compared with the number entered for the examination in 2004. The overall performance for this year was better than 2004. This was true for both the internal and external examinations.

The examiners continue to be concerned about the quality of candidates' responses to questions, especially to questions in which a scenario is described. Too many candidates provided responses that ignored the scenario. In addition, a number of candidates gave responses expected at the CSEC level rather than that at the CAPE level.

Also, several candidates used the functions and features of software interchangeably especially in their responses to questions in Module 2 and Module 3. In addition, some candidates identified the features/functions of software as advantages of software. For example, candidates gave the response 'sending messages' as an advantage of using the email system in an organisation.

The examiners wish to report that for each question, on both Papers 01 and 02, a few candidates scored full or very high marks. However, there were some candidates who attempted questions but failed to score any marks.

The examiners would like to encourage teachers to pursue the syllabus in an in-depth manner and to ensure that candidates are knowledgeable about a variety of IT tools, both hardware and software, and their applications within the home, school and office.

Internal Assessment

The examiners noted an overall marked improvement on candidates' performance.

A number of centres prepared assignments based on outdated guidelines rather than on the amended syllabus. Consequently, there were candidates who produced assignments that included web pages.

Concerning Form IT1-3 (Moderation of Internal Assessment Sample), a significant number of teachers either did not complete the form or completed it incorrectly. Attention should be paid to the calculation of the total marks obtained by each candidate as this may adversely affect the selection of samples submitted for moderation.

In a number of centres, all candidates did the same emerging technology. This should be discouraged.

Candidates should be reminded that their report should not be more than 2000 words. This approximates to eight, doubled-spaced pages, excluding appendices, table of contents, bibliography, diagrams, tables and graphs. Where the word count is exceeded, a maximum of 10 marks should be deducted from the candidate's score as stated in the guidelines.

PAPER I

Section I - Information Systems

Question 1

The question examined candidates' knowledge of the components (OUTPUT devices) of automated information processing systems and appropriate IT tools to be used in communicating information. This question was generally satisfactorily done by most candidates. Several candidates scored full marks.

A number of candidates ignored the scenario given and therefore their responses to the various parts of the question

were inappropriate.

For Part (a)(i), Any three of the following – monitor, printer, plotter, speaker, thermometer – were acceptable.

For Part (a)(ii), several candidates were unable to fully discuss an advantage to the operator of one device when compared with the other named devices. A few candidates viewed the monitor as an interactive device in that when the computer operator makes an error in entering a command, he/she can make the necessary corrective action by retyping the command. These candidates seemed not to be aware that it is not the monitor (an output device) that will allow the operator to make the correction but the keyboard (an input device). It is therefore evident that these candidates do not fully appreciate the differences and relationship between the various components of the automated information processing system.

A correct response could be “The rate of transmission of information to a monitor is faster (1 mark) when compared with the transmission of information to a printer (1 mark). This will allow the operator to react/respond quickly in the event of an emergency (1 mark)”.

For Part (b), a number of candidates did not state the type of information that named devices produced – text or graphic or sound; temporary or permanent; hard or soft copy of information. A correct response for a plotter could be “A permanent record of graphical output (1 mark) such as the temperature of the plant over the past 12 hours (1 mark)”.

Question 2

The question assessed candidates’ knowledge and understanding of the impact of information technology and the spread of viruses on the society. The question was generally well done by most candidates. Several candidates scored full marks.

In part (a), most candidates were able to partially define a computer virus. Many responses described the computer virus as a ‘virus’ or ‘thing’ rather than a ‘computer program’. To obtain the three marks, the candidate’s response should include the following:

- What it is – 1 mark
- What it does – 1 mark
- How it does it – 1 mark.

For example, “A virus is a software program (1 mark) that overwrites or attaches itself to other software or electronic documents (1 mark), causing damage such as destroying or corrupting data or deleting the contents of the hard drive (1 mark).”

In part (b), most candidates provided correct responses.

In part (c), many candidates listed the actions to be done when checking and removing computer viruses, however, most failed to properly sequence these actions. The question spoke of an approach, which is an indication that the sequencing of steps was required in their response.

Question 3

The question was designed to test candidates’ understanding of issues related to telecommunications and emerging technologies. This question was generally well done by most candidates. A few candidates scored full marks.

For part (a), most candidates performed well.

For part (b), a number off candidates named the ‘telephone’ as a hardware item that is required for telecommuting, when what is really required was the ‘telephone line’. Some candidates include database and spreadsheet software in their responses which meant that they ignored the scenario given – the editing of books and communicating with authors. Appropriate software should be DTP, word processing and email.

For part (c), some candidates either simply stated the advantage or provided a reasoning that did not support the advantage.

Question 4

This item examined candidates' knowledge of one type of information processing systems – Expert Systems. This question was generally poorly done by most candidates.

Most candidates gave responses which applied to expert systems in general rather than as it relates to MYCIN and doctors.

For part (a), a correct response was “An expert system is a set of interactive or question-and-answer computer programs (1 mark) based on a set of rules developed by experienced doctors (1 mark) that help inexperienced or junior doctors (1 mark) to diagnose infectious diseases and identify treatments (1 mark).”

For part (b), some usefulness to doctors are:

- Inexperience or junior doctors may use MYCIN to provide treatments for infectious diseases without having to refer their patients to specialist.
- Infectious diseases that can be fatal if not treated immediately can be quickly identified and the proper treatment dispensed.
- Training of student doctors can be fast-tracked in the area of infectious diseases and treatments. Without MYCIN, the training could take several years.

Some candidates confused expert systems with simulation programs and as such responded that MYCIN could be used for training student doctors in performing operations. Both types of system are grouped under Artificial Intelligence, but they are not the same.

Question 5

This question assessed candidates' knowledge and understanding of uses of and the impact of information technology on organisations.

This question was generally well done by most candidates. Several candidates scored full marks. A few candidates, however, for part (a), ignored the scenario given and therefore their responses reflected a changeover from a manual system to an automated information processing system. For part (b), some candidates discussed problems that could arise prior to the changeover, rather than after the changeover to new hardware and software as the question required.

Section II - Information Processing and Presentation

Question 6

This question examined candidates' ability to identify the category that a software tool belongs to, and to explain the purposes of the tool. The question was satisfactorily done by most students. A few students scored full marks.

For part (a) a number of candidates gave responses that spoke of the features of the tool rather than the purposes or functions of the tool. Responses such as “copy and paste” and “header and footer” are features of the tool. A more appropriate response, for example, would be “A spreadsheet allows the user to store numeric data in columns and rows, arranged in a grid, to facilitate calculations speedily.”

For part (b), most candidates identified the correct category to which the software belonged. However, many of them could not justify their response.

Question 7

The question assessed candidates' knowledge and understanding of the stages of problem solving, its importance in the successful implementation of solution, as well as, the appropriate of level of presentation of information to users. A few candidates scored full marks while most did poorly.

Part (a) was generally well done by most candidates. However, a few candidates confused the problem-solving process with the software engineering process. the purpose of such a software package.

Part (b) was generally poorly done by most candidates. The candidates were unable to state valid reasons why the stages such as problem definition, analysis, identification and evaluation of solutions should be completed prior to the implementation of any solution. Valid reasons included, but not limited to, the following:

- To determine the problem to be solved;
- To identify the objectives of the solution;
- To document the detailed requirements of the solution;
- To examine options that are available for solving the problem;
- To ensure that the company will not implement a solution that will not solve the problem.

Part (c) was generally poorly done by most candidates as they misinterpreted the meaning of the level of presentation of information to be graphical or textual. The level of presentation of information refers to how information is formatted and presentation at the various level of management within an organisation, that is, operational, tactical or strategic.

Question 8

The question assessed candidates' ability to select and justify the use of software tools to solve real-life problems. This question was satisfactorily done by most candidates. A few candidates scored full marks.

For part (a), most candidates responded correctly. A few candidates, however, gave unacceptable responses such as "general purpose software", "specialised software" and "application software". These are categories of software and not software packages.

For part (b)(i), a number of candidates listed features rather than the functions of the multimedia presentation package. Two functions of the package are:

- To create slide shows, and
- To create animated presentations

For part (b)(ii), most candidates simply stated the advantage rather than provide a discourse on the advantage.

Part (c) was poorly done by most candidates. It appeared that most candidates did not understand the question. Several candidates wrote responses such as "to act as a back up storage".

Some attention must be given in the classroom to the data types that could be used in construction of databases.

Question 9

This question assessed candidates' ability to select the most appropriate format to present information to a target audience. Most candidates performed at an acceptable level. A few candidates scored full marks.

A number of candidates seemed to be unaware of the various formats that can be used to present information/data to different groups. Some candidates gave responses such as "query" and "report" as formats that could be used by principal in presenting the findings on students' performance to the board. These are inappropriate responses. Examples of the format that could be used are tables, charts, graphs, and text (free format).

Question 10

The question examined candidates' understanding of productivity tools that can be used to develop solution to real life problems. This question was poorly done by most candidates.

For part (a), most candidates responded correctly. A few candidates, however, gave incorrect responses such as "general purpose software", "specialised software" and "application software". Other candidates wrote "spreadsheet" and "database management system" rather than naming a specific software package - Excel, Lotus 123, Access or FoxPro. Spreadsheets and DBMS are types/categories of software packages.

For part (b), most candidates ignored the scenario and therefore some of the features described could not assist Mr. Jones in finding a solution to his problem. Some candidates described functions rather than features. One feature of

the named spreadsheet (e.g. Excel) that would be beneficial to Mr. Jones is the grid that is a set of rows and columns: a row which is a horizontal group of cells to store all relevant data for each member and a column which is a vertical set of cells to store a specific attribute of each member.

For part (c), most candidates performed poorly. They were unable to accurately list and sequence the steps required to add new data fields to existing records.

Section III - Information and Communication Skills

Question 11

This question assessed candidates' knowledge and understanding of pairs of terms that are related to the Internet. The question was generally done satisfactorily by most students. A number of candidates scored full marks.

In part (a), some candidates simply stated what the abbreviations stood for rather than distinguishing between the pair – HTML and URL.

In part (b), a few candidates wrote the web authoring tool was “some thing that is used to identify the author of a web page while browsing the ‘Net.’”

In part (d), some candidates responded that the logon name was “a unique part of an email address which the may use to connect to a mail server.”

It was evident that a number of candidates did not know the features of and the Information Technology tools themselves that are widely used or commonly associated with the Internet.

Question 12

This question was designed to assess candidates' knowledge of the characteristics of information in the decision-making process. This item was generally satisfactorily done by most candidates. A number of candidates scored full marks.

Most candidates were able to identify the characteristics of information but had difficulties explaining them and citing appropriate examples to demonstrate how these characteristics are important to the decision-making process. Some candidates identified characteristics of information sources such as unbiased and refereed as characteristics of the information itself. Candidates should be made aware that although some characteristics of information sources are applicable to information, there are others which are not applicable.

A few candidates mentioned that collating, analysing and presenting are characteristics of information. This is not so.

Question 13

This question examined candidates' ability to identify pieces of information, and information sources that could be used in solving a problem facing an organisation. This item was generally poorly done by most candidates. A number of candidates scored full marks.

In part (a), most candidates correctly identified two pieces of information that the firm needed to help determine the feasibility of establishing a centre at a particular location. However, a few candidates gave responses that were irrelevant as they ignored the given scenario.

In part (b), for some candidates, the sources of information were confused with the tools used to gather information such as interviews, questionnaires and surveys.

In part (c), most candidates were unable to discuss a problem associated with the information sources identified in part (b).

Question 14

The question assessed candidates' knowledge and understanding of tools that could be used to access information remotely. This question was generally satisfactorily done by most candidates. A few candidates scored full marks.

For part (a), a number of candidates described situations which did not address how the information could be accessed from a remote site. Examples of appropriate response are as follows:

(a) Using a computer:

Dr Young, a local cardiologist, visited the website of a major pharmaceutical company in Europe (1 mark) to obtain information on a new approved drug for heart patients (1 mark).

(b) Using a telephone:

Prior to the doctor's round, Sister Jackson contacted the Government Laboratory, situated in the Capital (1 mark), to get the results of the blood test for a patient (1 mark).

A few responses dealt with using the computer to store large amounts of data or accessing information quickly rather than with how a person could use the computer to access information from a remote site.

For part (b), most candidates were able to discuss one problem adequately but not both. A few candidates simply stated the problems, for example, noise interference when using the telephone but failed to show how this problem affected the transmission/ quality of the information being transmitted.

Question 15

The question assessed candidates' knowledge of the Email System as a tool used to communicate information. This question was generally poorly done by a few candidates. A few candidates scored full marks.

Most candidates confused features with functions. Candidates were required to list uses of the email system such as sending messages to one or more persons, sending one or multiple attachments with a message, sending confirmation when message is received, storing received and sent messages for lengthy periods, etc.

For advantages, a number of candidates stated the advantages of the tool, for example, send messages quickly. However, these candidates did not state which tool the comparison was being made with and did not provide any explanation as to why this was considered an advantage.

PAPER II

Section I - Information Systems

Question 1

This question was designed to assess candidates' knowledge and understanding of the use of data flow diagrams (DFDs) to document the flow of information within an organisation. The question was attempted by approximately thirty percent of the candidates and was generally poorly done by most candidates. A few candidates scored full marks.

In parts (a) - (b), most candidates performed satisfactorily.

In part (c), most candidates were unable to correctly identify (extract) major processes from the list of activities provided with the question. In the table below are some suggested processes, along with the justification for each process.

| Activity | Process(es) & Justification |
|---|---|
| Organisations telephone the company requesting TEMPS to fill specific positions. These requests update the Request file. If the organization requesting a temporary employee is not on the Employer file, a record is created for the entity. | ADD NEW REQUEST - to process new requests for temporary employees (from organisations) ADD NEW ORGANISATION – to add new organisations to the database |
| A TEMP is selected to fill the temporary position based on qualification and availability. The Employee and Request files are used to identify the suitable candidate. | FIND SUITABLE TEMPORARY – to select the most suitable candidate from the database to fill temporary vacancy |
| A contract is sent to the selected candidate. Information is printed from the Employee, Request and Employer files. | PRINT TEMPORARY CONTRACT – to print the contract to send to selected candidate |
| The returned contract is used to update the Employee and Request files. | PROCESS RETURNED CONTRACT – to process returned contract so as to update the relevant files UPDATE EMPLOYEE or REQUEST FILE - to update the appropriate record on the file |
| Notification is sent to the organization requesting the TEMP to confirm the date and qualifications, as well as, name. | PRINT EMPLOYER NOTIFICATION – to print letter to notify organisation of temporary secretary’s information and so on. |

A few candidates confused the sub-processes (collecting, collating, analysing, presenting and disseminating) of the manual information process (refer to Syllabus) and the stages of the software engineering process with the processes as they relate to the flow of information within a system or organisation, for example, as outlined in the table above. However, what was surprising was the fact that a few of these candidates were able to produce a DFD with valid processes. For these candidates, they seem to be unaware of the link between the processes identified in part (i) with the DFD in part (ii). Teachers are encouraged to use similar approaches to this question to demonstrate how DFDs can be developed from the activities done in an organisation.

In drawing the diagrams, a number of candidates ignored the rules or guidelines associated with developing DFDs. In some instances, the wrong symbols were used; the correct naming convention for symbols was not followed; there were no arrowheads to indicate the direction of the information flow; processes were not numbered to show the sequencing of the processes; and arrows were not labelled. To obtain high or full marks, the candidates were expected to:

- Use the correct symbols for entities, processes, data stores and data flows.
- Label all symbols appropriately based on naming conventions.
- Number each process to reflect the overall flow of information.
- Identify the major processes, data stores, data flows and entities from the scenario.
- Develop the DFD based on rules and guidelines.

Question 2

This question examined candidates' knowledge and understanding of the legal and ethical issues that could arise from the use of information technology within organisations and the wider society. Approximately seventy percent of the candidates attempted this question. Most candidates performed satisfactorily.

Parts (a)(i) and (a)(ii) were poorly answered. A number of candidates viewed privacy from the generally accepted interpretation referring, for example, to (not a quote) "people not being able to peep while you were dressing". One candidate wrote that, "Privacy is the safe feeling of secrecy and space of an individual that is provided by others". A few candidates confused privacy with security of data, that is, not allowing unauthorised access to data. While most candidates attempted a response for privacy, a large number had not response for proprietary software.

Two acceptable responses were

- Privacy is the right of individuals (1 mark) not to reveal personal data such as financial status, medical details and current salary (1 mark) about themselves or to have it revealed by others (1 mark).
- Proprietary software is one for which the rights (1 mark) are owned by an individual or a company (1 mark) and it cannot legally be copied, sold or used without permission (1 mark).

For part (b), most candidates were able to state two reasons why a company might want to read its employees' email or monitor their use of the Internet, however, they could not adequately articulate any argument or explanation to justify their position to obtain full marks.

Part (c)(i) posed a challenge for some candidates. These candidates failed to properly name the computer crime and more so to show the link of the crime to the computer. There was much repetition and intermingling of crimes in the discussion of a SINGLE crime. For example, in discussing hacking, the candidate may speak about hacking, computer fraud, the spreading of virus, stealing of data from someone's machine, etc. This seems to suggest that many candidates did not have a clear understanding of a particular computer crime. A few candidates wrote that the downloading of copyrighted material was a crime but this is not necessarily so, especially if the person has paid for the electronic material. It should be noted that some candidates wrote about crimes that existed prior to the advent of computers, for example child pornography and identity theft. Although, the Internet easily facilitates such crimes, they are not viewed as computer crimes.

For part (c)(ii), most candidates did well in relating a safeguard to a crime, however, a few suggested strategies which themselves were computer crimes, for example, "placing a virus on the hacker's system to damage or destroy their hard drive".

Teachers are encouraged to use sites such as www.answers.com and www.whatis.com to get additional information on computer crimes.

Section II - Information Processing and Presentation

Question 3

This question assessed

- (i) candidates' ability to solve real-life problems using IT productivity tools, in particular, a database management system, and
- (ii) their knowledge of its advantages when compared with the spreadsheet.

The item was attempted by fifty-six percent of the candidates. Most candidates performed poorly. No candidate scored more than 24 marks.

For parts (a) and (b)(i), based on their response, it would appear that most candidates were not aware of the guidelines/rules concerning the design of forms and table in database management systems. Marks were awarded for the following:

Registration form to include:

- Appropriate heading (e.g. MILO SCHOOL GIRLS' FOOTBALL LEAGUE, etc);

- Consistent use of formatting (e.g. for dates – DD/MM/YYYY, Spacing, etc);
- Instructions (e.g. Please complete using BLOCK LETTERS, etc);
- Indication of the maximum length for each data field (e.g. use of boxes or lines);
- Names for all data fields (e.g. NAME, DATE OF BIRTH, ADDRESS, TELEPHONE, SCHOOL)
- Splitting name and address (e.g. FIRST NAME, MIDDLE NAME AND LAST NAME; ADDRESS1 and ADDRESS2)

SCHOOL table to include

- Contains data fields including School, Address, Telephone, Coach, - Games_Won, Games_Lost, Games_Drawn, Games_Played
- Appropriate data types
- Appropriate data lengths
- Appropriate input mask for telephone
- Existence of key identifier (e.g. School or School_Id)
- Validation for fields such as School
- Use of arithmetic expression to validate number of games played, that is, Games_Played = Games_Won + Games_Lost + Games_Drawn

For part (b)(ii), only a few candidates provided the appropriate response, recognising that both tables, PLAYER and SCHOOL, had to have a common data field (SCHOOL or SCHOOL ID), that is, a relationship must exist between the tables.

For part (c), most candidates lost marks as they ignored the scenario and as such provided advantages unrelated to the storing of the data (the details of the teams and players) in a database management system rather than in a spreadsheet.

Question 4

The question examined candidates' knowledge and understanding of features of the spreadsheet that will allow them to solve a problem. The item was attempted by forty-four percent of the candidates. Most candidates performed poorly. Except for one candidate, no one scored 18 marks.

Parts (a) and (b)(i) were generally done well by most candidates. However, for part (a), a few candidates identified some features that were inappropriate based on what the teacher wanted to do.

However, part (b)(ii), part (c) and part (d) posed some difficulty. Most candidates were not able to justify their response for part (b)(ii). For part (c), some candidates provided an explanation for a single column rather than for two columns. For part (d), only a few candidates could name a function that would allow the teacher to determine the number of students receiving each grade (e.g. COUNTIF). Others, however, although not naming a function, indicated that they knew what the function ought to do.

Section III - Information and Communication Skills

Question 5

This question was designed to assess the candidates' knowledge and understanding of the issues that may arise from the use of Internet by organisations. The item was attempted by approximately sixty percent of the candidates. This question was generally poorly done by most candidates. A few candidates scored full marks.

For part (a), most candidates listed four benefits but were unable to clearly demonstrate how an organisation would gain from the stated benefits and for part (b), they did not provide any justification why the stated problem would influence management's decision to restrict the use of the Internet.

For part (c), most candidates correctly identified an alternative tool as a communication medium. Most candidates provided limited discussion to justify the tool as a suitable alternative, and many fail to submit any argument regarding an implication of using this alternative.

Question 6

This question was attempted by forty percent of the candidates. It assessed candidates' understanding of information and its importance to the decision-making process. This question was generally well done by most candidates.

A few candidates scored low marks as they provided weak or no arguments to justify their position. For example, as to whether or not a piece of information such as "The country is a democracy with a stable political and economic climate" was essential or cosmetic, a few candidates responded that the piece of information is essential because "it is vital". These candidates failed to show why the particular piece of information was vital to the shareholders. A more appropriate response could be:

This piece of information would help to reassure shareholders that their investment is not at risk either politically if there is a change of government or economically as the country has a stable economic climate.

INTERNAL ASSESSMENT

This project enabled candidates to examine the potential uses and issues related to a particular emerging technology, and to determine its applicability to their environment (school, community, country or the Caribbean region). Additionally, it enabled the candidates to demonstrate skills and competencies from each of three modules.

The candidates who scored high used the marking scheme to structure and organise their report, thereby, focussing on the areas that were relevant to the study.

Most candidates performed well. Several candidates submitted very good papers demonstrating that they did substantial information gathering on the emerging technology.

A few candidates confused data types with data fields. Data types refer to text, numeric, date/time, currency, Boolean, etc whereas data fields refer to the names given to data elements within a table, for example, in a table called student, some data fields could be name, date of birth, gender, address and telephone.

Some candidates had collected and analysed data that has little or no relevance to their study. Also, graphs and tables are included in their reports without any justification for their inclusion.

Several candidates submitted assignments based on topics that are not relevant to Information Technology. For example, some candidates did research on Human Cloning and Genetics, which are both outside the scope/content of the syllabus. Teachers are encouraged to guide candidates in the selection of the emerging technology for study.