

C A R I B B E A N E X A M I N A T I O N S C O U N C I L
HEADQUARTERS

**REPORT ON CANDIDATES' WORK IN THE
SECONDARY EDUCATION CERTIFICATE EXAMINATION**

MAY/JUNE 2007

INFORMATION TECHNOLOGY

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INFORMATION TECHNOLOGY

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GENERAL COMMENTS

In June 2007, 24 755 candidates from the participating territories entered for the Information Technology examination; 980 entered for General Proficiency and 23 775 for Technical Proficiency. The final number sitting the examination was 20 653, with 856 writing the General Proficiency and 19 797 writing the Technical Proficiency. In 2006, 19 718 wrote the examination hence there was a 4.7 percent increase in the number of candidates writing the Information Technology examination in 2007.

DETAILED COMMENTS

PAPER 01 – THEORY

This paper consisted of four sections. Sections I and II consist of ten compulsory short-answer questions, testing the theory profile and are to be done by both the Technical and General Proficiency candidates. Section III tests competency in Programming and is to be done by Technical Proficiency candidates. Section IV focuses on competency in Productivity Tools and is to be done by General Proficiency candidates.

The mean scores on the Theory profile for the General and Technical Proficiencies were 47.72 out of 90 (approximately 53 percent) and 34.47 out of 90 (approximately 38 percent), respectively. Marks ranged from 1 – 79 for the General Proficiency candidate and 0 - 81 for the Technical Proficiency candidate.

In Section III, programming continues to challenge candidates. Most candidates were not well prepared to handle basic concepts in Programming.

SECTION I

Question 1

This question tested candidates' competency as it relates to the identification, categorization and use of input, output and storage devices.

There were nine objects and the majority of candidates correctly identified and categorized five of these. Objects 4, 5, 8, and 9 challenged candidates. In particular object 5 (USB Flash Drive) was referred to by colloquial names such as Tom drive, Tongue drive, joint stick and USB.

The majority of candidates were unable to identify a specific use for icon 4 in Information Technology. Uses include back-up and archiving.

Question 2

This question tested candidates' ability to identify and categorize printers and to state their uses.

The majority of candidates were able to identify printer 2 by name and to state its use. Many candidates were unable to identify printer 1 (Plotter).

Many candidates identified a printer that was noisy and were able to explain its purpose.

Many candidates seemed unfamiliar with the thermal printer and confused it with the laser printer. In addition, some candidates described the printing mechanism rather than the use of the printer.

Question 3

This question tested candidates' ability to distinguish between the types of user interfaces.

The majority of candidates were able to identify the interfaces but did not use the correct terminology such as graphical user interface and command line interface.

Most candidates were able to describe one advantage and one disadvantage of interface 1 (graphical user interface) but could not do the same for interface 2 (command line interface).

The majority of candidates were able to identify the interface where a mouse is used.

Question 4

This question tested candidates' ability to identify files and folders in a directory structure.

This question was poorly done by the majority of candidates who could not distinguish between a file and a folder in a directory structure. In addition, the majority of candidates were unable to write the path of a file in the directory structure.

Question 5

This question tested candidates' ability to identify and take corrective actions to solve problems when using a diskette.

This question was well done by the majority of candidates who were able to identify the errors and provided corrective measures. Some candidates confused the reason for the errors with the corrective measures.

SECTION II

Question 6

This question tested candidates' ability to describe IT applications used in the areas of finance, education, entertainment and communication.

This question was well done by the majority of candidates who were able to correctly identify the relevant IT applications.

Question 7

This question tested candidates' ability to identify and explain concepts associated with the Internet.

The majority of candidates were able to explain the meanings of the Internet terms and to state their uses.

Question 8

This question tested candidates' ability to identify tasks and qualifications of personnel in a computer-related environment.

The majority of candidates were able to identify the tasks and qualifications of a computer system consultant and an end-user support provider. Some candidates did not know what the term "qualification" meant.

Question 9

This question tested candidates' ability to describe the concepts of teleconferencing and videoconferencing.

This question was well done by the majority of candidates; although, some candidates could not provide the correct equipment needed for teleconferencing and video conferencing.

Question 10

This question tested candidates' ability to identify computer crimes.

This question was not well done by the majority of candidates. There was the tendency to simply describe the crimes rather than state whether the crime occurred in the given scenario.

SECTION III – PROGRAMMING

Question 11

This question tested candidates' ability to identify different generations of programming languages.

This question was not well done. Many candidates did not identify the generation of the programming language but instead stated the programming languages used in the diagrams.

Many candidates could not provide one advantage and one disadvantage of each generation. Some candidates seemed to be familiar with only the third generation of programming languages.

Question 12

This question tested candidates' ability to identify programming statements.

The majority of candidates were able to correctly identify Input and Process statements but could not identify the single Output statement.

Question 13

This question tested candidates' knowledge of variables and data types.

The majority of candidates were able to identify the variables but were unable to indicate the correct data types for the variables. Many candidates were also able to compute the value of the variable, Total.

Question 14

This question tested candidates' ability to trace a segment of programming codes.

This question was not done well. The majority of candidates could not trace through the segment of programming code correctly. Many candidates copied the program code but did not state the output.

SECTION IV

Question 15

This question tested candidates' knowledge of basic features of a word processing program.

This question was done satisfactorily by the majority of candidates. There were some areas however, in which candidates experienced difficulty. These included:

- Describing the difference between centre text and fully justified text;
- Describing the sequence of steps to get a task done.

Question 16

This question tested candidates' knowledge of basic features of a spreadsheet program.

This question was well done by the majority of candidates. Some candidates however, were unable to explain the use of absolute addressing.

Question 17

This question tested candidates' knowledge of basic features of a database management program.

The question was satisfactorily done by the majority of candidates. There were some areas, however, in which candidates experienced difficulty. These included:

- Creating the structure of the table with appropriate field names, type and size;
- Providing an example of a record;
- Printing the output of a query.

PAPER 02 & 02/2 – TECHNICAL PROFICIENCY

Paper 02 consisted of three questions testing the profiles Word Processing, Spreadsheet and Database Management.

Paper 02/2 is the alternative to paper 02 and tests the same three profiles namely, Word Processing, Spreadsheet and Database Management.

The mean score for paper 02 was 91.78 out of 150 (approximately 61 percent). The range of marks obtained by the candidates was 0 – 150.

The mean score for paper 02/2 was 92.22 out of 150 (approximately 62 percent). The range of marks obtained by the candidates was 0 – 150.

Question 1 – Spreadsheet

This question tested candidates' ability to use various features of a spreadsheet program.

This question was well done by the majority of candidates. Some areas of difficulty were:

- Using absolute cell referencing in a formula
- Advanced filtering of data in a spreadsheet
- Sorting data (use of correct data range)
- Graphing (use of correct data range)
- Formatting:
 - Use of percentage with correct decimal places
 - Use of correct alignment
 - Use of correct font type and size
 - Use of merge and centre
 - Use of borders
- Use of date function
- Printing formula sheets
- Setting up page for printing

Question 2 – Database

This question tested candidates' ability to use various features of a database management program.

This question was satisfactorily done by the majority of candidates. Some areas of difficulty were:

- Tables
 - Use of appropriate data types
 - Deletion of whole record versus deletion of a field
- Queries
 - Use of calculated fields
 - Use of update queries
 - Linking tables
 - Use of logical operator

- Reports
 - Use of footer in the report
 - Grouping and sorting data in a report

Question 3

This question tested candidates' ability to use various features of a word processing program.

This question was well done by the majority of candidates. Some areas of difficulty were:

- Formatting features:
 - Setting the margins
 - Use of columns
 - Inserting page numbers
 - Location of headers and footers
 - Finding and replacing text

- Mail merge:
 - Insertion of merge fields
 - Printing of the required number of merge letters

PAPER 02 – GENERAL PROFICIENCY

This paper consisted of two sections. Section I consists of four questions on Information Processing of which candidates were required to do question 1 and any two other questions. Section II consists of four questions on Programming of which candidates were required to do question 5 and two other questions.

The mean score for this paper was 70.58 out of 150 (approximately 47 percent). The range of marks obtained by the candidates was 2 – 132.

For the optional questions (2, 3, 4, 6, 7 and 8), 81 percent of the candidates did question 2, 70 percent of the candidates did question 3, 48 percent did question 4, 50 percent of the candidates did question 6, 76 percent of the candidates did question 7 and 63 percent of the candidates did question 8.

Questions directly related to programming (4, 5, 6, 7 and 8) continue to be the greatest challenge to candidates. The mean scores for questions 4 – 8 were 8.7 out of 24 (approximately 36 percent); 17.1 out of 27 (approximately 63 percent); 10.7 out of 24 (approximately 45 percent); 8.2 out of 24 (approximately 34 percent) and 6.3 out of 24 (approximately 26 percent), respectively.

SECTION 1 – INFORMATION PROCESSING

Question 1

This question tested candidates' ability to:

- Differentiate between data and information;
- Identify data logging devices used in various situations;
- Describe the application of automatic information processing functions.

The majority of candidates were able to differentiate between data and information. However, some candidates had difficulty explaining how the given data were formatted.

The majority of candidates could not describe an appropriate application to automate the Information Processing functions and provided a description of the sensors.

Identification of data logging devices was poorly done by the majority of candidates. Candidates confused data logging with monitoring and control systems.

Question 2

This question tested candidates' ability to:

- Identify the stages of the system development life cycle;
- State the reasons for specific activities in the system development life cycle;
- Describe the responsibilities of IT personnel in the system development life cycle.

The question was well done. The majority of candidates were able to provide good reasons for specific activities in the system development life cycle; correctly identify the stages of the system development life cycle and describe the responsibilities of IT personnel.

Question 3

This question tested candidates' ability to:

- Draw a data flow diagram and a decision table, based on a given scenario;
- Identify the processing mode suitable for the given scenario;
- Represent data in standard form;
- Manipulate binary data.

The majority of candidates were able to create both the data flow diagram (DFD) and the decision table (DT) on the given scenario. Candidates were also able to identify and describe the type of processing mode suitable for the given scenario.

The majority of candidates were able to represent the given number in standard form. Some candidates incorrectly referred to the mantissa as the decimal portion of the number (.312). The manipulation of the binary data was well done by the majority of candidates.

Question 4

This question tested the candidates' ability to:

- Identify appropriate methods of data capture;
- Identify methods of data validation and verification;
- Trace through a program segment in assembly language;
- Explain the concept of program counters.

The majority of candidates were able to identify appropriate methods of data capture but had difficulty in interpreting the given data in terms of codes. Many candidates provided definitions of data validation and verification instead of providing specific data checks.

The majority of candidates were able to trace through the program segment but some candidates were unable to recognize that the value for AMT was constant throughout the program segment.

The term "program counter" was unfamiliar to the majority of candidates.

SECTION II – PROGRAMMING

Question 5

This question tested the candidates' ability to express an algorithm in code using a familiar programming language.

The majority of candidates were able to write a program based on the given algorithm. A variety of programming languages were used. This demonstrated adequate competency in the skill of translating an algorithm into code.

Question 6

This question tested candidates' ability to use a structured method such as a trace table to calculate the results of a set of values.

This question was not well done. The majority of candidates who attempted this question wrote programming codes instead of demonstrating how the values within variables changed during processing as the calculations were done.

Using trace tables to test the correctness of an algorithm is a significant part of the early stages of problem solving. The performance in this topic suggests that greater emphasis is needed in the area of problem identification and testing.

Question 7

This question tested the candidates' ability to:

- Use a trace table to determine the value of given variables;
- Identify and correct errors in a segment of program code;
- Use logical operators;
- Explain the terms associated with running a program.

The construction and use of a trace table to map out changes in the value of variables in a segment of program code challenged candidates. The majority of them could not compute the final values for "x" and "a".

Most candidates were able to identify and correct the errors in the segment of code provided. Some candidates were unable to represent the conditions correctly.

The majority of candidates seemed unfamiliar with interpreting and writing logical statements.

Most candidates were able to provide adequate definitions of the terms "interpreter" and "compiler".

Question 8

The question tested candidates' ability to:

- Draw a flowchart to represent an algorithm;
- Write a segment of programming code to represent the given algorithm.

This question was poorly done by the majority of candidates. Many candidates were unable to correctly draw the flow chart to represent the given algorithm. Moreover, many candidates did not use standard flow charting symbols and did not complete all of the tests given in the algorithm. Additionally many candidates were unable to code the algorithm.

The performance on this question is consistent with the observations noted in the previous questions (5, 6 and 7). It also validates the earlier point that there must be a greater focus on problem identification and testing.

SCHOOL-BASED ASSESSMENT (SBA)

Technical Proficiency

The Technical SBA component consists of a project prepared and marked by the teacher and consists of three practical assignments testing the application of word processing, spreadsheet and database management skills.

The mean score was 46.51 out of 60 (approximately 78 percent). The range of scores was 0 – 60.

GENERAL COMMENTS

Schools continue to submit samples with projects on different application areas. Many projects submitted had detailed and relevant project descriptions. Some projects also tested skills outside of CXC guidelines.

Samples were generally well presented. There were some however, that lacked organization, were not properly bond and did not clearly indicate where each application solution began and ended.

Samples presented continue to show improved candidates' knowledge of the content of the syllabus.

The submission of detailed marking schemes by teachers, adhering to CXC guidelines, continues to improve. This has lead to more consistent marking by the teachers.

Teachers must ensure the following:

- Diskettes and CDs are not required and should not be submitted. In addition marking should be done from the printed work and not from the diskette /CD.
- Moderation sheets must be included with samples and care must be taken when transcribing and transposing marks. Marks and names on moderation forms must be the same as those on the samples.
- Mark schemes submitted must adhere to CXC guidelines. In particular, specific criteria profiles and weighting must be adhered to.
- Fractional marks are not allowed.
- Detailed project description must be submitted at all times.

SPECIFIC COMMENTS

Word Processing

WP1: Headers, Footers, Footnotes and Endnotes

This was well done in most cases. It should be noted however, that some of the samples submitted used text and graphics that were not legible. In addition, in many samples, marks were assigned by teachers to work where the footer (for example, page number) was not automatically generated by the application but was a performed operation by the candidate.

WP2: Combine Documents

Samples indicate that this section was rarely tested; but marking schemes suggest that candidates had mastered this skill and were awarded full marks.

WP3: Block Operations

This section was rarely tested and few samples made reference to this section on the mark schemes submitted by the teachers.

WP4: Columns

This section was tested in a high percentage of samples presented. Most candidates demonstrated the ability to perform this skill accurately and effectively.

WP5: Tables

Most candidates exhibited the ability to create basic tables in a document. Candidates now need to concentrate on improving the quality of the tables by making use of borders and shading.

WP6: Document Formatting Features

Most candidates did this section very well. However, superscript and subscript features were rarely tested and in a few cases marks were allocated for the automated superscript generated when a date is written.

WP7: Search and Replace formatting

This section was rarely tested. The submission of a project description and marking scheme by the teacher would be useful in demonstrating that this mark was correctly assigned in the marks awarded to the candidates.

WP8: Mail Merge

The majority of candidates were tested in this area using various types of documents (flyers, brochures, envelopes, invitations).

The following were observed:

- Submission – Some candidates did not submit all of the required documents, namely the data source and the primary document.
- Merge – The main document and primary document, in some cases were being used interchangeably. There should be some clear distinction between the two. Some candidates used the greater than sign (>) and the lesser than sign (<) rather than including the actual merge field symbols in the document. Marks were not awarded for incorrect symbols by the moderator, but in many cases, these marks were awarded by the teacher. It should be noted that the **main** document is the **plain** document while the **primary** document is the document containing the **merge** fields.
- Printing – Some candidates printed too many copies of the secondary document (the completed merge document). The first, middle and last documents of the merge would be adequate to award the relevant marks for this section of the SBA.

WP9: Spell check

This section was poorly tested in the samples provided.

WP10: Importing files

This section was frequently tested in the samples submitted. Most candidates demonstrated the ability to execute this skill effectively. However, more attention must be placed on the sizing of the imported objects.

WP11: Page orientation/Margins

Many candidates demonstrated the ability to perform the landscape operation. In some cases marks were awarded by the teacher for portrait orientation, which is the default orientation. Marks should only be awarded for operations being performed by the candidates and not by the computer's default system.

WP12: Overall Presentation

There was an improvement in the samples presented this year. However, the samples should be securely bound and neatly packaged, with each section appropriately labelled.

WP13: Overall application to the Word Processing assignment

Most students demonstrated awareness of the existence of basic word processing features.

Recommendations

Teachers should place more attention on testing and recording features that can be clearly seen on the samples submitted; for example, tables, headers, columns and importing files. The mail merge feature of the syllabus should be taught in greater detail. ALL of the required documents must be printed and submitted consecutively so that marks awarded can be easily identified.

Spreadsheet

- The sum function was the most widely used function. However, in many instances it was not well utilized. Teachers are advised to guide students on the correct use of functions.
- There is a need to differentiate between a formula and a function.
- The majority of students demonstrated an appreciation for most of the spreadsheet features.
- Formulae sheets must be submitted. These should be printed directly from the spreadsheet software application package.
- Columns and rows should be highlighted to indicate insertions and deletions.
- Candidates demonstrated an understanding of most formatting features. In some instances, too many marks were allocated for formatting. Emphasis should be placed on merge and centre for headings.
- Primary fields were well sorted but irregularities occurred when sorting on secondary fields.
- The use of criteria referencing is a major weakness for most candidates. To be awarded marks in this area, candidates must show evidence of the criteria as well as the output range.
- Labelling of chart axes and the selection of non-adjacent ranges need to be emphasized. The creation of charts in projects is encouraged for spreadsheet operations.
- Emphasis must be placed on improving evidence of linking worksheets.
- Page numbering and sections within the spreadsheet should be clearly identified.
- Spreadsheets, especially formulae sheets should be legible.

Database Management

Tables

- Many schools created the required three tables with improvements in joining of tables.
- Some schools went beyond three tables.
- Some tables had too many fields and records.
- Proof of primary keys, relationships and indexing must be shown, that is, print design views of these objects.
- Where there are modifications of fields (such as deletions) proof must be shown, that is, before and after screen shots should be printed.
- Too many marks were allocated to some table development assessment criteria.

Queries

- Many schools created four queries which tested/assessed different skills such as updates, deletions, calculation and selection.
- Some schools had too many queries testing the same skills.
- Each query should be given a specific name.
- Printed evidence should be provided, with care taken to extend the property section, where, for example, calculations are to be assessed, print the design view of queries ensuring visibility of all field sections.

Reports

- Many schools showed a general improvement in reports.
- There was evidence of summary statistics and grouping, in most instances.
- Titles were appropriate for reports, in most instances.
- There were instances in which titles were too short, vague or altogether missing.
- Where columns are to be printed, landscape paper option should be selected or paper of an appropriate size used.

GENERAL PROFICIENCY

The General Proficiency SBA requires candidates to develop a computer solution to a meaningful problem using the knowledge and skills acquired in the Information Processing and Programming profiles.

The mean score was 41.98 out of 60 (approximately 70 percent). The range of scores was 4 – 60.

With the exception of a few cases, the projects submitted this year showed some improvement over the previous year. Samples were generally well organized in terms of their presentation.

Programming techniques continue to improve, expanding beyond the traditional programming languages into concepts where objects are manipulated. In some cases, however, candidates did not display a sufficient range of data structures.

Although the topics selected in this year's projects varied, they still clustered in the area of data storage and retrieval systems. In some cases, these were rather limited in scope. Candidates focused simply on the problem being solved and did not include other file management operations such as additions, deletions and sorting which would have given the project greater depth.

While there were some excellent projects submitted, there were still too many that were not substantive enough and were rather limited in scope. Teachers should ensure that the projects selected are manageable and meet the requirements specified in the syllabus.

SPECIFIC COMMENTS

Problem Definition

- Candidates were generally able to identify a problem but had difficulty expanding on the specifics of the problem. Hence, the description was generally not substantive. It should be noted that the syllabus requires a description of approximately 150 words.
- It is also important that candidates use the specification tools. In some cases where these were used, they did not comply with existing conventions.
- There were still some cases of candidates describing the system being designed rather than the problem they wish to solve.

Problem Solution

- There was a great disparity among the levels of candidates in this area. Some candidates demonstrated a high degree of proficiency in creating appropriate algorithms and flowcharts while many candidates were weak in this area.
- When flowcharts were done, they generally adhered to conventions. In some cases, candidates used the programming languages to represent the algorithms rather than pseudocode.

Working Program

- It is incumbent upon candidates to demonstrate clearly that the programs they have created work. A variety of test data should be used to show the full range of program actions. A sufficiently wide range of screen shots should also be included.
- In some cases, no program was submitted or there was no clear delineation between the problem solution and the working program.

User Documentation

- User documentation in most cases were either inadequate or incomplete. In a number of cases, it was limited to the installation of the program.
- It would be useful to include screen shots and other appropriate diagrams to enhance descriptions given.

Internal Documentation

- Most candidates were able to indent statements within the programs to make them easier to read. However, comments within the program were limited and data dictionaries explaining the use and purpose of the variables were noticeably absent, in most cases.

Presentation

- Candidates continue to satisfy the requirement for submitting projects. The majority of candidates submitted well presented projects.

Creativity

- Most candidates were able to use appropriate solutions to the defined problem. However, some information retrieval systems lacked scope and there was very little manipulation of the data shown.

Evaluation

- Candidates' evaluations of systems created were still rather superficial in nature. Candidates generally did not demonstrate a high degree of proficiency in identifying the strengths and weaknesses of the projects created. In some cases, candidates focussed on evaluating the company for which the system was created rather than the system created to solve the problem.