

CARIBBEAN EXAMINATIONS COUNCIL
HEADQUARTERS

REPORTS ON CANDIDATES' WORK IN THE
SECONDARY EDUCATION CERTIFICATE EXAMINATION

MAY/JUNE 2008

INFORMATION TECHNOLOGY

INFORMATION TECHNOLOGY

MAY/JUNE 2008

GENERAL COMMENTS

In June 2008, 23298 candidates from the participating territories entered for the Information Technology examination; 1079 entered for General Proficiency and 22219 for Technical Proficiency. This represents an increase of 11.84 per cent in registration for the Information Technology examination when compared with June 2007.

DETAILED COMMENTS

PAPER 01 –THEORY

This paper consisted of four sections. Sections I and II consisted of ten compulsory short-answer questions testing the theory profile and is common to both the Technical and General Proficiencies. Section III is the Programming section for Technical Proficiency candidates and Section IV is the Productivity Tools section for the General Proficiency candidates. The mean scores for General and Technical Proficiencies were 48.2 out of 90 and 38.6 out of 90 respectively. The range of marks obtained by the General and Technical Proficiencies candidates were 0 - 76 and 0 - 78 respectively.

SECTION I

Question 1

This question tested candidates' ability to classify and state the names of the pictures representing input, output and storage devices.

The majority of candidates were able to classify and state the names of the pictures representing input, output and storage devices. However, some candidates had difficulty classifying Figure A and stating its correct name (Hard Drive).

Question 2

This question tested candidates' knowledge of various application packages and their ability to classify them.

The majority of candidates were able to correctly classify the application packages. However, many candidates were unable to differentiate among them.

Question 3

This question tested candidates' ability to identify and solve basic problems related to printers.

The majority of candidates were able to identify and provide solutions to basic problems with printers. However, some candidates were unfamiliar with the term, 'multi-part form'. In addition, some candidates were unclear about the differences between the terms 'hardcopy' and 'softcopy'.

Question 4

This question tested candidates' ability to identify files and folders in an MS-DOS directory structure.

The majority of candidates were able to correctly identify the type of user interface and to identify the files and folders in a directory structure. However, some candidates provided the path of the folder rather than the name of the folder.

Question 5

This question tested candidates' knowledge of the various types of processing methods.

This question was satisfactorily done by the majority of candidates. Some candidates however, could not relate the type of processing to a data transmission method.

SECTION II

Question 6

This question tested candidates' knowledge of the term 'Electronic Eavesdropping' and measures used to secure data.

The majority of candidates could explain the term 'Electronic Eavesdropping' however, some candidates did not include unauthorized access in their explanation.

The access methods posed some difficulty to candidates. Some candidates could not identify any physical access method used to secure data. Most candidates could not provide a good reason for having sharing restrictions on a document.

Question 7

This question tested candidates' knowledge of the application of telecommunication systems (Teleconferencing, Telemarketing and Telecommuting) and current technological trends (CADD, CAE and CAM).

The majority of candidates displayed knowledge of the application of telecommunication systems as well as current technological trends. Many candidates however, did not specify the differences among 'Teleconferencing', 'Telemarketing and Telecommuting'.

Question 8

This question tested candidates' knowledge of e-commerce activity on the Internet.

The majority of candidates displayed some knowledge of e-commerce activity on the Internet. However, some candidates were unfamiliar with the use of credit cards in purchasing items on the Internet.

Question 9

This question tested candidates' ability to identify and explain concepts associated with the World Wide Web (WWW).

Most candidates were not familiar with some of the concepts associated with the WWW. Some candidates could not distinguish between the website and the webpage in a given URL.

Question 10

This question tested candidates' ability to state the characteristics and uses of MICR and to differentiate the roles of a system analyst and a network manager according to the tasks given.

The majority of candidates were unfamiliar with the use of MICR to process check in Banks. Candidates were able to assign the given tasks to the System Analyst and the Network Manager but did not explain why the tasks were assigned to the two positions.

SECTION III - PROGRAMMING

Question 11

This question tested candidates' ability to match given program statements with levels of programming languages and to identify the different generations of programming languages used.

This question was satisfactorily done by the majority of candidates. However, some candidates did not identify the generations of programming languages used.

Question 12

This question tested candidates' ability to classify a given set of tasks as input, output, processing or storage and to place the tasks in the correct sequence.

The majority of candidates were able to correctly classify processing and storage tasks but many confused the input with the output tasks. Most candidates were able to place the first and second steps in the correct sequence. However, the third, fourth and fifth steps were sequenced incorrectly.

Question 13

This question tested candidates' knowledge of given logical operators and their ability to trace program segments to determine the outputs.

The majority of candidates were able to state the name of the logical operators. However, some candidates were unfamiliar with the 'not equal to' operator (<>).

Many candidates were not able to provide the correct outputs for the program segments. In many cases, the conditional statements in the program segments were ignored.

Question 14

This question tested candidates' ability to, trace a segment of a program to identify assignment, loop and output statements, complete a trace table, and state the result of the algorithm.

Many candidates were able to identify the assignment, loop and output statements, however, the majority of candidates could not complete the trace table and hence, indicate the result of the algorithm.

SECTION IV

Question 15

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

This question was well done by the majority of candidates. Some candidates could not describe the steps involved in moving text and changing line spacing.

Question 16

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

This question was satisfactorily done by the majority of candidates. Some candidates could not explain how to merge and centre.

Question 17

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

The question was poorly done by the majority of candidates. Some candidates had difficulty in determining the field size and the features used in generating a report.

PAPER 02 & 02/2 – TECHNICAL PROFICIENCY

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

Paper 02/2 is the alternative to Paper 02 and consisted of three questions testing Word Processing, Spreadsheet and Database Management.

The mean score for Paper 02 was 94.3 out of 150. The range of marks obtained by the candidates was 0 - 150

The mean score for Paper 02/2 was 92.8 out of 150. The range of marks obtained by the candidates was 0 - 150

Word Processing - Question 1 of Paper 02 / Question 3 of Paper 02/2

This questions tested candidates' ability to use various features of a Word Processing program.

This question was generally well done by the majority of candidates but there were some areas of difficulty. There were as follows:

Formatting features:

- Setting the margins
- Setting the line spacing
- Use of columns
- Location of headers and footers
- Use of subscript format

Mail Merge:

- Printing the primary document with the merge fields inserted correctly
- Printing the merge letters without any post-merge modifications

Spreadsheet – Question 2 of Paper 02/ Question 1 of Paper 2/02

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 as follows:

- Advanced filtering of data:
 - Setting up the criteria and extraction ranges
 - Use of correct criteria
- Sorting data:
 - Selecting the correct data range
 - Selecting the correct column and order for the sort
- Graphing:
 - Selecting the correct data range
 - Labelling the pie chart and labelling the axes of column chart
- Formatting:
 - Use of percentage with correct decimal places
 - Use of correct alignment – right align numeric columns
 - Use of merge and centre
 - Use of ALL borders
- Formulae and Functions:
 - Use of formula to calculate percentages
 - Use of function to compute the average
- Printing the spreadsheet:
 - Selecting the worksheet and the chart for printing

Database Management – Question 3 of Paper 02 / Question 2 of Paper 2/02

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

Candidates continue to print unnecessary documents for example SQL codes and design view of tables. In addition, candidates displayed a lack of keenness in organizing their printouts in the question sequence.

This question was satisfactorily done by the majority of candidates. However, some areas of difficulties were as follows:

- Table:
 - Use of appropriate data types
- Sorting:
 - Selecting the correct order of sort in a table
 - Using multiple search fields
- Queries:
 - Use of calculated fields
 - Linking tables
 - Use of summary features – SUM, AVERAGE
 - Use of correct criteria
 - Creating a Word Processing document with all the queries
- Reports:
 - Use of footer in the report
 - Inserting title
 - Grouping and sorting data in a report
 - Use of summary feature – SUM, AVERAGE

PAPER 02 - GENERAL PROFICIENCY

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

The mean score for this paper was 73.2 out of 150. The range of marks obtained by the candidates was 0 – 137.

In section 1, candidates were able to choose from the three optional Questions (2, 3 & 4) with Questions 2 and 3 being the popular choices. In section 2, candidates were able to choose from the optional Questions (6, 7 & 8) with Questions 6 and 7 being the popular choices.

SECTION 1 – INFORMATION PROCESSING

Question 1

This question tested candidates' ability to

- State the advantages and disadvantages of Information Processing
- Describe the use of control systems that use sensors
- State the reasons for creating and modifying information systems
- Differentiate between quantitative and qualitative data collection methods
- Explain the importance of the different phases of the System Development Life Cycle.

The majority of candidates were able to provide the advantages and disadvantages of Information Processing.

Many candidates provided satisfactory description and examples of Control Systems, however, a number of candidates were not familiar with pressure Pad Sensors and Light Sensors.

The majority of candidates were able to provide two reasons for creating or modifying an information system.

The majority of candidates could not differentiate between qualitative and quantitative data collecting methods.

Most of the candidate could identify the stages of the System Development Life Cycle, however, candidates were uncertain about the importance of the stages in the System Development Life Cycle.

Question 2

This question tested candidates' ability to

- State the purpose and advantage of keeping a data dictionary
- Identify the features of a given database table
- Draw and explain the symbols used in a data flow diagram
- Create a decision table based on a given scenario.

The majority of candidates confused data dictionary with a spell checker.

The majority of candidates were able to provide the name of the table and the primary key, however, the majority of candidates could not distinguish between fields and properties of a given field.

The majority of candidates were able to draw and explain the symbols used in a Data Flow Diagram. Some candidates however, provided symbols used in a flowchart.

Most of the candidates were able to provide the conditions and actions for the given scenario but were unable to create the complete Decision Table. The majority of candidates provided 3 instead of the 4 rules in their Decision Tables.

Question 3

This question tested candidates' ability to

- Update a master file using a transaction file
- Differentiate among the type of processing – batch, interactive and online
- Explain the purpose of validation and verification of data
- Explain and provide an example of range check and data type check
- Represent number in floating point format
- Identify errors when representing numbers in a computer system

The majority of candidates were able to update a master file using a transaction file. However, some candidates were unable to state the name of the new master file as the son file.

The majority of candidates were able to state that the type of processing in the given scenario was Batch Processing. However, candidates were unable to explain why it was Batch Processing.

The majority of candidates were able to state the purpose of validation and verification of data.

The majority of candidates were able to explain and illustrate a range check but were unfamiliar with data type check.

The majority of candidates were able to identify the parts of a floating point representation.

Candidates provided a variety of errors but errors such as overflow, underflow and truncation were not common.

Question 4

This question tested the candidates' ability to

- Describe various methods of file organization and access
- Explain how machine instructions are represented in a computer

The majority of candidates could not differentiate among the three types of file organization. Candidates were unfamiliar with Index Sequential file organization.

The majority of candidates were unfamiliar with 'machine instructions' and could not answer the various parts of the questions relating to 'machine instructions'.

SECTION II – PROGRAMMING

Question 5

This question tested the candidates' ability to write a program based on a given algorithm using a programming language. The majority of candidates were able to write a program based on the algorithm. A variety of programming languages were used with Pascal programming language being the most popular. Some candidates declared the variables as integer instead of real numbers. Some candidates were also unable to write correct IF-THEN statements.

Question 6

This question tested the candidates' ability to complete a trace table for a given program segment and determine the outputs. The majority of candidates demonstrated the ability to trace the program segments and indicate the outputs. In part (b), some candidates could not use the given operators (% , * , /).

Question 7

The question tested candidates' ability to draw a flowchart to represent a given algorithm and to write the program to implement the algorithm. The majority of candidates were able to write the program to implement the algorithm but only a few candidates provided the appropriate flowchart with correct symbols and labels. Some candidates used the Data Flow Symbols instead of the flowchart symbols.

Question 8

This question tested the candidates' ability to trace a selection sort program segment, to identify error and to produce a trace table. The candidates who attempted this question could not identify the error and were not able to produce a complete trace table. Many steps in the candidates' trace tables were missing.

SCHOOL-BASED ASSESSMENT (SBA) TECHNICAL PROFICIENCY

The Technical SBA component consists of a project prepared and marked by the teacher. It consists of three practical assignments testing skills associated with Word Processing, Spreadsheet and Database Management.

The level and variety of projects submitted by schools continue to be of a high standard. Many projects seen had detailed project descriptions that met the guidelines as described in the syllabus. Samples were generally well presented. However, there were a few samples that lacked organization, and were not properly bounded or demarcated.

The provision of mark schemes adhering to CXC guidelines continues to improve, however, some centres were negligent in this area and this impacted negatively on the performance of some candidates. Each sample submitted should have an accompanying detailed mark scheme clearly showing how the marks were allocated and awarded for skills' set under consideration. The difficulties experienced in this area were sufficiently large to warrant concern.

Although most centres submitted the same project and mark scheme for all candidates in the sample, there were some instances where within one sample there was more than one type of project and associated mark scheme represented. It is recommended that a centre create a single project. The candidate's work should be centre moderated and a sample submitted to CXC for further moderation.

Candidates continue to demonstrate improved levels of knowledge of syllabus content. However, Teachers should take note the following:

- **All submission of samples should be in hard copy (printed format). Diskettes and CDs are not required and should not be submitted.** In addition, marking should be done using the printed work rather than from the softcopy on diskette /CD. If the latter is done, then teachers should ensure that all work for which marks were awarded is printed. There were far too many samples in which marks were allocated for work supposedly done that could not be verified.
- Moderation sheets must be included with samples and care must be taken when transcribing and transposing marks. Names and marks on the accompanying moderation forms should match those in the sample.
- Mark schemes submitted must adhere to CXC guidelines. In particular, specific criteria profiles and weighting must be adhered to. Fractional marks are not allowed. Further, there is a maximum of 20 marks allocated for each component (Word processing, Spreadsheet, Database Management).
- A project description and detailed mark scheme **must** be submitted with each sample.
- Candidates must enter **all registration** details on their project and submit it in order, with the parts appropriately labelled and pages numbered. All parts of the project should also be attached neatly and securely. The better candidates used table of content and page numbering.

Specific Comments

The following gives a more detailed description of the issues associated with each of the productivity tools under consideration:

Word Processing

The following outlines the positive as well as the negative factors in relation to the marking of the Word Processing component. In general there was some improvement in the quality and variety of the assignments. For most candidates, there was great improvement in the creativity and use of Word Processing features. A wide range of documents were produced. These included brochures, flyers, invitations, programs, tables and newspaper articles. However, some schools submitted samples that were unacceptable and improperly bounded. In addition, sections were not clearly labelled or clearly demarcated and this presented a challenge for the moderators. Some suggestions for further improvement of SBA samples are listed below.

Teachers should ensure that:

- They are knowledgeable about the mark scheme in order to guide the candidates in the correct direction
- Individual mark schemes submitted conform to the syllabus guidelines, assessment criteria and mark allocation
- Assignments or tasks are marked according to the syllabus (there were some inconsistencies with the mark schemes used)
- The **primary document, data source** and **merged documents** in a mail merge are prepared and printed. If a table is used from the Spreadsheet or Database Management section as the data source for a mail merge, it should be included in the Word Processing section of the SBA. A significant number of candidates did not print the main/primary document showing the merge fields in the mail merge, instead they submitted a document showing field names bounded by less than or greater symbols (e.g. <<FirstName>>) for merges fields. This is unacceptable.

It can be concluded that there was a general improvement in the assignments submitted and that candidates' creativity were demonstrated in the creation of mail merged brochures, flyers and invitations.

Spreadsheet

Overall, this component was generally well attempted and demonstrated good creativity.

The majority of candidates were able to perform the spreadsheet formatting tasks such as font changes, bold and centre. However, there was limited evidence of advanced formatting skills – merging cells, text wrapping. (SS8).

Sorting was very well done. Most candidates were able to sort correctly on both the primary and secondary fields (SS9). This is commendable.

Insertions/deletions (SS7) are not evident and the skill cannot be verified as having been achieved when candidates do not print the data **before** and **after** the insertions/deletions. It would also simplify the process if candidates would use labelling or high lighting effectively to illustrate what they have done. It is unfortunate that some candidates were penalized for failure to produce the necessary documentation to prove that they had achieved the competency under consideration.

A clear differentiation between formulas and functions must be made. Formula sheets must be submitted to provide the necessary evidence of the functions used, replication of formula, use of absolute cell referencing and criteria referencing (SS1,2,5,10).

In many of the samples there was some level of graphical representations used but it was not always assessed by the teacher. In most cases, candidates demonstrated a high degree of proficiency in this area, however, some attention should still be given to the appropriate labelling of chart axes and the procedures for selecting non-adjacent ranges (SS11,12).

Database Management

The following observations were made after moderating the samples for the Database Management profile of the Technical proficiency:

- **DB1** Generally this was done well. However, there were some instances where the currency data type was not used correctly; also decimal places were not rounded off correctly. The queries given in some instances were not very challenging.
- **DB2** Overall this area was handled well. There were few instances though, where results were incorrect due to incorrect relationships being created. There were also cases where there were no record to match the stated criteria.
- **DB3** This was generally handled well. There were instances however where candidates failed to follow the specific instruction as given in the SBA assignment. For example, students might have been asked to sort in ascending order, but did so in descending order instead.
- **DB4** This criterion was not popular among the SBAs given. Where it was assessed, however, some candidates did not provide SQLs to prove their ability to remove the indexing facility.
- **DB5** This criterion was handled relatively well by some candidates. In many instances, candidates did not demonstrate effective use of grouping of required fields or statistical and summary features.

A minority of assignments required exporting a report to MS-Word. In some instances, this proved advantageous to candidates because this was the only evidence of them having done a report.

- **DB6** In the majority of instances candidates did not provide evidence of modifications made (e.g. delete a record, modify a field). Candidates needed to provide a **before** and **after** table to show that the operations were performed.

- **DB7** This was handled relatively well. There were only a few cases where assignments did not require calculated fields.
- **DB8** This criterion was handled well. Evidence in the form of screen shots and entity relationships were seen in many instances.
- **DB9** Not many assignments required operations requiring importing graphics and sizing them appropriately. However, the importing of tables (correct importing/conversion) was generally handled well.
- **DB10** This was generally well done.
- **DB11** Although in most instances the required printouts were submitted, the level of detail presented was unnecessary. Candidates should be encouraged to present just SQLs for the query definitions and the field names, data types, field sizes and indexes for the table structures.

In terms of presentation, candidates should be encouraged to group the different sections of the database properly – tables together, queries together.

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.

GENERAL COMMENTS

Candidates continue to submit work that is of a high standard. The level of presentation of the samples can be described as commendable. CXC guidelines were followed and candidates were awarded the majority of marks. On average ninety percent of the marks was allocated to this section.

There seems to be some difficulty with the approach to Problem Solving and Programming this year. Candidates seem to be coding a solution to the problem defined before creating a viable working solution first. As a consequence, there were clear weaknesses demonstrated in the use of tools such as algorithms, flowcharts and Data Flow Diagrams. There were also significant weaknesses in the level and range of Data Structures used.

Although there was variation in the range of topics selected, candidates still favoured data storage and retrieval systems. Some of them were not adequately developed and the results were very limited in scope. Teachers should ensure that the projects selected are substantive yet manageable.

SPECIFIC COMMENTS

Problem Definition

Candidates listed problems but did not explain the objectives of the system they were creating. Some candidates seemed confused about the distinction between Data Flow Diagrams and Flowcharts. Most Data Flow Diagrams seen were done incorrectly. Urgent attention is needed in this area.

User Documentation

Adequate screen shots must be used as proof of a working program. Most candidates were able to describe the installation of the system under development but failed to go beyond this into explaining and giving examples of how the system worked. Installation is important but there is a need for more steps – from installation to exiting the program.

Creativity

Problem selection should be more imaginative. Candidates should explore more than one method of solving the problem before settling on the best way forward. Time spent in this area is reflected in the comments made in the evaluation of the system.

Evaluation

Most candidates show substantial weakness in providing a substantive evaluation of their system. There was often no critical analysis of the program. Recommendations should also be thorough. Many candidates demonstrated weaknesses in this area. It is important to note that the length of this section as specified in the syllabus is approximately 1 to 2 pages (300 words).

Problem solution

Algorithms need to be strict algorithms and not edited programs. In other words, it was evident that a significant number of candidates coded first and then produced an algorithm from the working program. In some cases, the only difference seen between the algorithm and the program code was the non-declaration of variables. Flowcharts were fairly well utilized and some candidates tried to use Structure Charts with some degree of success.

Working Program

There was a reasonably good attempt at using program features and program structures. There should be a greater use of text files and arrays in some programs. In most cases, very little evidence was given to support a working program using the test data provided. Proof of this should include screen shots clearly showing how the program handles correct and incorrect data.

Internal Documentation

Most candidates gave comments to indicate the functioning of the major structures such as subprograms or loops. Not enough comments were present to explain the purpose of the variables used and some of the other minor program structures.