

**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**

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

**MAY/JUNE 2014**

**INFORMATION TECHNOLOGY  
GENERAL PROFICIENCY EXAMINATION**

## GENERAL COMMENTS

The June 2014 examination was attempted by 22 889 candidates compared with 26 715 in June 2013. Approximately 82 per cent achieved acceptable grades (Grades I–III) as compared with 81 per cent in the previous year.

Overall, more candidates attempted all the questions including Section III as compared with previous years. Candidates continue to write the question in their responses. Teachers should encourage students to write brief answers. There were many cases where candidates provided multiple answers to a question which require only one response.

## DETAILED COMMENTS

### Paper 01 – Multiple Choice

This paper consisted of sixty (60) multiple choice questions testing all areas of the syllabus. Overall, this paper was well done by the majority of candidates; the mean for this paper was 68 per cent. A few areas presented some challenges to candidates. These areas included file organization and file access methods; identification of the type of program statements (input, processing, output, and storage); use of arrays and using the view feature in PowerPoint.

### Paper 02 – Structured Questions

This paper consisted of three sections with a total of twelve (12) compulsory structured questions. Section I consisted of six (6) short answer questions worth a total of sixty (60) marks testing the Theory profile. Section II consisted of two (2) structured questions worth a total of fifteen (15) marks testing the Productivity Tools profile. Section III consisted of four (4) structured questions totalling forty-five (45) marks testing the Problem-Solving and Program Programming profile.

#### Section I — Theory

##### Question 1

This question tested candidates' ability to arrange units of storage in descending order from the largest capacity to the smallest capacity and to state the names of hardware devices used to perform given tasks.

Part (a) of the question was poorly done by the majority of candidates who arranged the units of storage from the smallest to largest instead of from the largest to smallest order as required in the question. An example of a correct response is as follows:

*Terabyte /TB  
Gigabyte /GB  
Megabyte /MB  
Kilobyte /KB*

Part (b) of the question was well done by the majority of candidates. In Part (v) some candidates provided output devices such as printer rather than audio output device such as speakers or headphones. An example of a correct response is as follows:

- (i) ALU*
- (ii) RAM (Main Memory)*
- (iii) Control Unit*
- (iv) Magnetic Ink Character Reader (MICR)*
- (v) Speaker or Headphones*
- (vi) Scanner or digitizer or light pen or web camera*

## Question 2

This question tested candidates' knowledge of the concepts of verification and validation.

Part (a) of the question was poorly done by the majority of candidates who seemed familiar with validation checks but were unable to apply their knowledge to identify the PURPOSE of the checks with reference to the data entry form provided. An example of a correct response is as follows:

- (i) *Checks First Name to ensure that the data is alphabetic (letters).*
- (ii) *Checks Number of brothers attending this school to ensure that the number entered is lower than a fixed reasonable number.*
- (iii) *Checks Date of Birth to ensure that the data is within the allowable range for students entering the school*
- (iv) *Checks Current Age to ensure that the age is correct given the current date and the Date of Birth*

Part (b) of the question was poorly done by the majority of candidates who seem familiar with the terms verification and validation but were unable to differentiate between them. Examples of correct responses are as follows:

*Verification ensures that data is inputted accurately while validation checks that data is complete, allowable, reasonable or sensible. OR*

*Verification is a process carried out by humans while validation is an automated process carried out by computer software.*

## Question 3

This question tested candidates' ability to identify hardware specifications and software programs from the specifications given for a computer system

Overall, this question was satisfactorily done by the majority of candidates. Some candidates did not provide the complete specification as given. For example, for Part (a) candidates wrote Intel rather than Intel Celeron B815 Dual core as the type of processor. Some candidates also confused operating system software (Part (h)) with general purpose software (Part (i)). In addition, many candidates did not identify the number of USB ports (Part (f)). An example of a correct response is as follows:

- (a) ***Intel® Celeron® B815 Dual Core***
- (b) ***1.60 GHz***
- (c) ***SATA***
- (d) ***1366 × 768***
- (e) ***headphones, Speakers, LED display (any 2)***
- (f) ***3***
- (g) ***Weight or Dimensions or Size of Battery***
- (h) ***Microsoft Windows 7 Home Premium 64-bit Edition***
- (i) ***Microsoft Office 2007 (Full Version)***

#### Question 4

This question tested candidates' knowledge of forms of information processing and methods of file organization and file access.

Part (a) of the question was satisfactorily done by the majority of candidates. Candidates may need to be exposed to more of these scenario-based applications involving information processing. An example of a sample response is as follows:

- (i) ***Commercial Information Processing***
- (ii) ***Scientific Data Processing***
- (iii) ***Process Control***
- (iv) ***Automation/Industrial Processing System***

Part (b) of the question was poorly done by the majority of candidates. Indexed sequential file organization and machine readable document posed difficulty to many candidates. Candidates may need to be exposed to more of these scenario-based applications involving file organization and access methods as well as to machine readable document as a source of data. An example of a sample response is as follows:

- (i) ***file organization: sequential  
type of access: sequential***
- (ii) ***file organization: indexed sequential  
type of access: random/direct***
- (iii) ***Direct/random***
- (iv) ***Machine readable document***

#### Question 5

This question tested candidates' knowledge of concepts associated with data communications and networks. The overall mean for this question was 38 per cent.

Part (a) of the question was satisfactorily done by the majority of candidates. Some candidates did not provide the full names of the cables and indicated fibre cable instead of fibre optic cable. An example of a correct response is as follows:

***Coaxial, Fibre Optic, Twisted pair (any two)***

Part (b) of the question was poorly done by the majority of candidates. Most candidates confused wireless media (satellite, microwave, infra-red) with wireless network technologies (Bluetooth, wi-fi). An example of a correct response is as follows:

***Satellite, Microwave, Infra-red (any two)***

Part (c) of the question was well done by the majority of candidates who seemed familiar with simplex and half-duplex data transmissions. An example of a correct response is as follows:

***Simplex transmission allows data to be transmitted in one direction only while Duplex transmission allows data to be transmitted in both directions but in only one direction at a time***

Part (d) of the question was poorly done by the majority of candidates. Candidates seem to confuse Intranet with a LAN and Extranet with WAN. An example of a correct response is as follows:

***Intranet cannot be accessed from outside of the organization but Extranet can be accessed from wherever the user has access to the Internet***

Part (e) of the question was well done by the majority of candidates who provided a suitable reason for the establishment of an Extranet by an organisation. An example of a correct response is as follows:

***Allows employees to work away from office or to provide access to customers, suppliers, board members, etc.***

Part (f) of the question was fairly well done by the majority of candidates. Susceptible to hacking was the popular disadvantage of an Extranet. Some candidates incorrectly mentioned that an Extranet is more costly to setup. An example of a correct response is as follows:

***Susceptible to hacking or electronic surveillance***

#### Question 6

This question tested candidates' knowledge of measures to secure data, data integrity and appropriate methods to verify that data is inputted accurately.

Part (a) of the question was well done by the majority of candidates. Some candidates confused physical restrictions with software restrictions. An example of a correct response is as follows:

***Place computers in a secured area or use of security guard or use of biometric devices or use of locks.***

Part (b) of the question was well done by the majority of candidates. The use of password was the popular correct choice. An example of a correct response is as follows:

***Use of passwords or encryption or firewall***

Part (c) of the question was satisfactorily done by the majority of candidates. Most candidates only provided two (2) out of four (4) distinct ways in which the integrity of the data can be destroyed. An example of a correct response is as follows:

***Any FOUR (4) of the following:***

- (i) Human error***
- (ii) Natural disaster***
- (iii) Worms and viruses***
- (iv) Hardware malfunction***
- (v) Fraud /hacking***
- (vi) Malicious deletion or changing of data***

Part (d) of the question was poorly done by the majority of candidates. Most candidates did not recognize that the question was asking for restoring data in a local area network environment and incorrectly provided answers on restoring online data from the Internet. An example of a correct response is as follows:

***Upload the last Back-up and update uploaded files with the records from the incremental dumps***

Part (e) of the question was poorly done as most candidates confused verification and validation methods. An example of a correct response is as follows:

Data is entered by one staff member and the same data is entered by another staff. Both sets of data are then compared to ensure that they are the same (double entry). Use of proof-reading is also acceptable.

Section II – Productivity Tools

Question 7

This question required candidates to identify basic features and functions of a spreadsheet program.

Part (a) of the question was fairly well done by the majority of candidates. Some candidates wrote the required cell address in the incorrect format. For example, 3E instead of E3.

Part (b) of the question was well done by the majority of candidates who provided the correct SUM function.

Part (c) of the question was poorly done by the majority of candidates. Most candidates seemed unfamiliar with the MAX function and instead incorrectly used the HIGHEST and AVERAGE functions -. However, the correct range was provided for the function used.

Part (d) of the question was fairly well done by the majority of candidates. Some candidates incorrectly identified the line graph which was displayed as a frequency polygon, graph chart and line bar chart.

Part (e) of the question was poorly done by the majority of candidates. Most candidates listed the surnames instead of the range containing the surnames.

The correct responses for Question 7 is as follows:

- (a) ***E3***
- (b) ***SUM(C4..E4)***
- (c) ***MAX(C2..C5)***
- (d) ***Line graph***
- (e) ***B2..B5***

Question 8

In this question candidates were required to demonstrate their knowledge of basic features of a database management program.

Part (a) of the question was fairly well done by the majority of candidates. Most of the candidates indicated date as the data type for the *DateofBirth* field but incorrectly indicated number as the data type for the *StudentNo* field .

For Part (b) of the question, the majority of candidates correctly identified the most appropriate field that may be used as the primary key.

Part (c) of the question was poorly done by the majority of candidates. Most candidates correctly identified the primary field but not the secondary field for sorting the data in the PARENTS table.

Part (d) of the question was well done by the majority of candidates who were able to correctly identify the field to join the tables.

Part (e) of the question proved challenging to the majority of candidates. Some candidates provided structured query language (SQL) codes while other use query by example (QBE) to do the query. In both cases, some of the components for the query were not provided.

The correct responses for Question 8 are as follows:

- (a) *StudentNo: text and DateofBirth: date*
- (b) *StudentNo.*
- (c) *Surname and FirstName.*
- (d) *StudentNo*
- (e) *Use of SQL*

*Select \* from students  
where House = "Lara"*

*OR use of QBE*

<i>TABLE</i>	<i>FIELD</i>	<i>CRITERIA</i>
<i>STUDENTS</i>	<i>HOUSE</i>	<i>"Lara"</i>

Section III – Problem Solving and Programming

Question 9

This question tested candidates' ability to arrange given steps in problem solving in the correct order and to indicate the most appropriate variable type to store the data given.

Part (a) of the question was fairly well done by the majority of candidates. The weaker responses did not provide the correct complete sequence of steps in problem solving.

The correct response is as follows:

- Define the problem*
- Propose and evaluate solutions*
- Determination of the most efficient solution*
- Develop and represent algorithm*
- Test and validate the solution*

Part (b) of the question was poorly done by the majority of candidates who confused data types used in database management (alphanumeric, numeric and logical) with variable types used in programming. (integer, real, character, string/literal, Boolean). The correct responses are as follows:

- (i) *Integer*
- (ii) *Real/Floating point*
- (iii) *Character/Boolean*
- (iv) *literal/string*

Question 10

This question required candidates to arrange steps in program implementation in the correct sequence and to differentiate between programming languages.

Part (a) of the question was poorly done by the majority of candidates who provided the incorrect sequence. An example of a correct response is as follows:

- Create source code*
- Compile program*
- Link program*
- Execute program*
- Maintain program*

Part (b) of the question was fairly well done by the majority of candidates. Some candidates however, wrote that first generation languages had numbers instead of 0's and 1's and did not explain the difference. An example of a correct response is as follows

*First generation language is written in binary code and a Second generation language uses some alphabetic characters/mnemonic code*

Part (c) of the question was poorly done by the majority of candidates. Candidates knew about machine language and high level language codes but were unable to provide one difference between them. An example of a correct response is as follows:

*Any TWO of the following:*

- 1. Machine language code is machine dependent; high level language code is machine independent*
- 2. Machine language code can be executed immediately; high level language code must be compiled or interpreted*
- 3. Machine language is written in binary while high level language uses English-like statements*

Part (d) of the question was very well done by the majority of candidates who seemed familiar with fourth generation languages. An example of a correct response is as follows:

*Any ONE of the following*

- 1. Fourth generation language is easier to use than Third generation language*
- 2. Fourth generation language provides greater help to the user than Third generation language*
- 3. It is easier to train a user to use a Fourth generation language than a Third generation language*

Question 11

This question tested candidates' ability to complete a trace table for a given algorithm; and to write an algorithm to read two different numbers and print the smaller one.

Part (a) of the question was poorly done by the majority of candidates. Many candidates did not recognize that the value of the variable N remains constant and did not provide the correct changing values for Product and Times in the trace table. The correct response is as follows:

<b>N</b>	<b>Product</b>	<b>Times</b>
<b>4</b>	<b>1</b>	<b>1</b>
<b>4</b>	<b>1</b>	<b>2</b>
<b>4</b>	<b>2</b>	<b>3</b>
<b>4</b>	<b>6</b>	<b>4</b>

Part (b) of the question was fairly well done by the majority of candidates. Some candidates wrote the correct variables but incorrectly put the variables in quotes, printed the wrong variable based on their conditions and did not use the 'then' in the if-then-else control structure. In addition, some candidates provided Flowchart and IPO diagrams instead of pseudocode. An example of a correct response is as follows:

```
Read Num1, Num2  
If Num1 < Num2 Then  
    Print Num1  
Else  
    Print Num2
```

### Question 12

This question required candidates to write program statements in Pascal for the algorithm given.

Part (a) of the question posed a great deal of difficulty for most candidates. In many cases, candidates seem unfamiliar with the use of arrays in Pascal. In cases where the candidates attempted to declare the array, the correct structure and syntax were not used. An example of a correct response is as follows:

```
VAR  
    MARKS : array[1..10] of integer;
```

Part (b) of the question was fairly well done by the majority of candidates. In many cases, candidates declared Average as an integer rather than real. In addition, some candidates used an assignment operator (:=) rather than the colon (:) used in declaring variables.

An example of a correct response is as follows:

```
var  
    SUM : integer;  
    AVERAGE : real;
```

Part (c) of the question was fairly well done, Most candidates did not use the assignment operator (:=) and provided arbitrary values instead of zero.

An example of a correct response is as follows:

```
SUM := 0;
```

Part (d) of the question was poorly done. Some candidates sum the individual array elements rather than using a looping structure, which is a more efficient way to sum the array elements. For candidates who used looping structure, the proper syntax was not used and the logic in the loop was incorrect.

An example of a correct response is as follows:

```
SUM := MARKS[1] + MARKS[2] + MARKS[3] + MARKS [4] + MARKS [5] + MARKS[6] + MARKS [7] +  
MARKS[8] + MARKS[9] + MARKS[10];
```

OR using the FOR loop

```
for index: = 1 to 10 do  
    SUM := SUM + MARKS[index];
```

OR using the WHILE loop

```
Index := 1  
While index <= 10 do  
begin  
SUM:= SUM + MARKS[index];  
Index := index + 1;  
end;
```

OR using the REPEAT loop

```
Index := 1  
Repeat  
SUM:= SUM + MARKS[index];  
Index := index + 1;  
Until Index = 11;
```

### **Paper 03 – School-based Assessment (SBA)**

The school-based assessment consisted of a practical project testing Profile 2 - Productivity Tools (word processing, spreadsheets and database management), and Profile 3 - Problem-Solving and Programming.

#### **GENERAL COMMENTS**

##### Word-processing

There has been some improvement in the performance. However, some teachers are still creating assignments that do not meet the full demands of the CSEC syllabus..

##### Spreadsheets

The majority of samples were well done. There has been an improvement in the quality of submissions when compared to samples in the previous years.

##### Database Management

In the majority of the samples received, the database management section was attempted. The attempts in this section were fairly well done but there are improvements that can be made.

##### Problem Solving and Programming

Generally, the standard of the performance of the candidates for this section of the SBA can be described as moderate to fair. Largely, the presentations were acceptable, but overall the problem solution lacked creativity.

There was improvement in the distinction between the algorithm and program code, that is, very few candidates presented the Pascal code as an algorithm.

## DETAILED COMMENTS

### Word Processing

1. Teachers were creative in formulating their own SBA questions and should be commended for this. Some of these questions however, were not structured to assess skills relevant to the Word Processing syllabus, such as formatting features (inclusive of creating tables, columns, text formatting, changing page and text orientations)
2. In some cases, teachers' mark schemes were inconsistent with the CSEC mark scheme (e.g. candidates were awarded marks for content rather than completion of specific tasks or marks awarded exceeded the suggested maximum).
3. Candidates were awarded fractional marks (e.g. half or quarter marks) in some cases. This does not meet CXC's requirements. Additionally, there were instances where too many marks were allocated for smaller components, for e.g. Use of graphics – 3 marks instead of 1 mark (as is specified by the syllabus).
4. In some cases, teachers submitted duplicates of the same SBA for all candidates. It is advised that teachers encourage students to be creative in completing their individual projects.
5. Most candidates used headers and footers. Footnotes and endnotes were rarely used. Headers or footers should appear on consecutive pages especially in cases where the mail merge feature is used. Headers should not fall far down on the page as this is not proof of ability to effectively use the feature of the word-processor.
6. Most of the formatting features were used by all candidates. However, a few important ones were rarely demonstrated, such as simultaneous use of single and double line spacing and multiple page layouts (where text flows from one page onto another) in Figure 1, book fold as seen in Figure 2 (where two pages are printed on one page) and justification. It must be noted that 2 marks are awarded for formatting, and 2 marks for multiple page / book fold / columns. Students are expected to demonstrate competencies in using at least two in each category in order to get the full 2 marks awarded. Fewer than two will result in the candidate receiving only 1 mark or no marks.

**Figure 1. Multiple Pages**

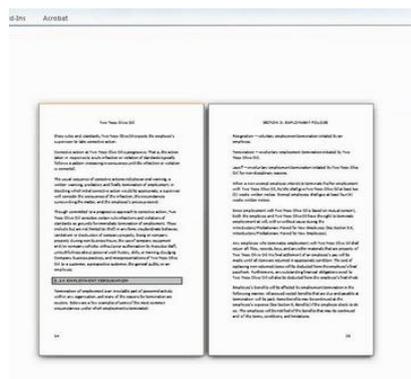
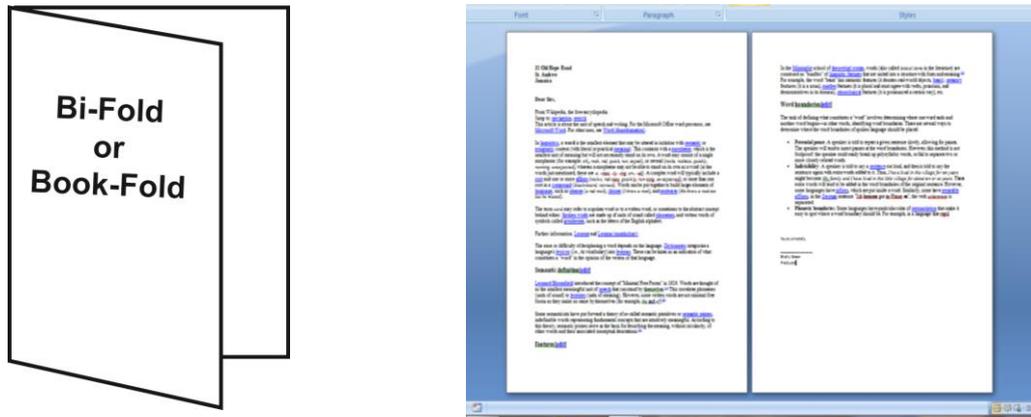


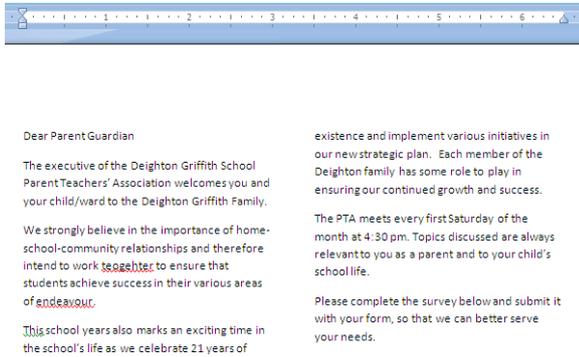
Figure 2. Book Fold



7. Evidence of insertion or deletion of text (word, sentence or paragraph) / graphic must be shown within the document. Therefore it is important to submit copies of documents showing a **before** and **after** as proof that this was done.
8. The effective use of tables and columns was not tested within the guidelines of the syllabus. Most candidates did not display effective use of either feature. Column use involves separating text into “newspaper style” (e.g. 2 or 3 columns). Table use involves demonstrating how data can be added to a table and then modified with appropriate borders and shading using the word-processing application. Figure 3 shows examples of how columns and tables may be presented.

**Figure 3. Example of appropriate use of columns and tables**

**Appropriate use of columns**

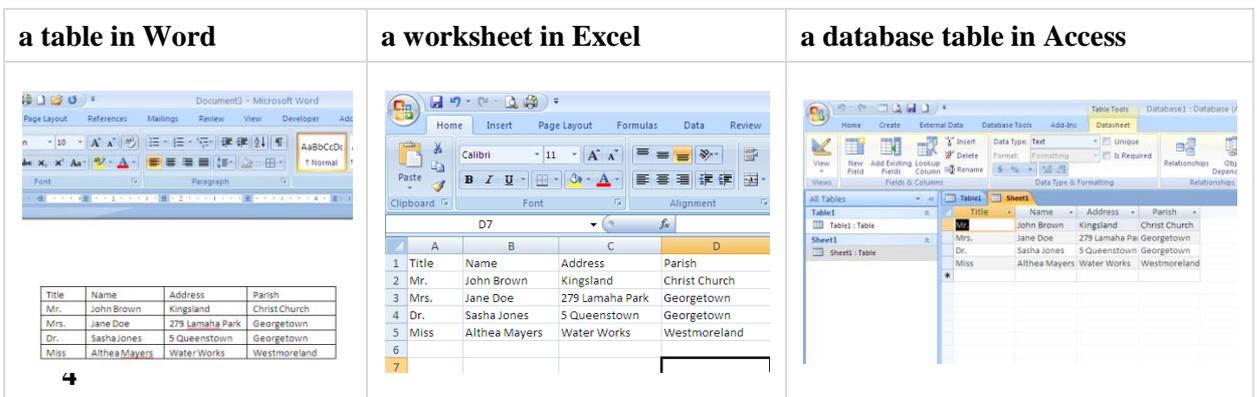


**Appropriate use of tables**

This school years also marks an exciting time in the school's life as we celebrate 21 years of existence and implement various initiatives in our new strategic plan. Each member of the Deighton family has some role to play in ensuring our continued growth and success.	This school years also marks an exciting time in the school's life as we celebrate 21 years of existence	We strongly believe in the importance of home-school-community relationships and therefore intend to work <b>together</b> to ensure that students achieve success in their various areas of <b>endeavour</b> .
The executive of the Deighton Griffith School Parent Teachers' Association welcomes you and your child/ward to the Deighton Griffith Family.	The PTA meets every first Saturday of the month at 4:30 pm. Topics discussed are always relevant to you as a parent and to your child's school life. Please complete the survey below and submit it with your form, so that we can better serve your needs.	

**N.B.** Tables imported from other applications to Word are marked as “ability to import...” worth 1 mark, and not as “tables” for 2 marks.

- While **ALL** teachers submitted a completed CSEC Moderation Sheet for the School Based Assessment, there were instances where the marks on the Moderation Sheet differed from the scores on the mark scheme. There were also cases where a component was missing from the project yet marks were shown on the Moderation Sheet. It is recommended that teachers mark the print outs of the assignments submitted by the candidates and not from the soft copy before the document is printed (as this might be the cause for the discrepancies).
- All assignment details were not submitted, e.g. Data source, a.k.a. the secondary document as evidence of the mail merge. As shown in Figure 4, this could be either:



**Figure 4. Examples of required assignment details**

- Instead of providing screen shots, show the actual mail merged documents. No mark is awarded for screen shots of the window of a Microsoft Word document, for example, that contains merged fields.

All required printouts for the mail merge were not submitted. Candidates should submit

- A primary document *without* merge fields inserted
- A primary document *with* merge fields inserted in the appropriate location.  
Merge fields should be linked to the data source rather than typed in by the candidate.

For example,

Correctly inserted fields	Typed merge fields
«Title»«Name» «Address» «Parish»	<Title><Name> { Address } <<Parish>>

- (c) A copy of the data source (as secondary document) mentioned above in #11 above
- (d) A small sample of printouts of the **completed merge** (*at least three but no more than five*)
- (e) Candidates are **NOT** required to print all the merged letters.

12. The overall quality of the selected samples was fair.

## Spreadsheets

### Formula sheets

Formula sheets were not submitted for some samples. This proved to the detriment of the sample as marks were not awarded. The formula sheet provides evidence to the authenticity of formulas. Formula sheets need to be printed from the formula view in Microsoft Excel. It should also have a reasonable font size. The font sizes of some formula sheets were very small and therefore made the scoring difficult.

### Appropriate Formula

Teachers need to ensure that students use correct formulas and functions to produce the correct answers. It was observed that although the right function was used e.g. =sum, the function contained incorrect information for example, =sum(F9\*G12).

### Range names

It was seen that the proper usage of range was not understood by the students. Students were confused over a range and range names. Generally, range names were not utilized much.

### Manipulating the Spreadsheet

There needs to be clearer evidence of spreadsheet manipulation. Copying, inserting and deletions of rows and columns should have before and after printouts of the particular sections of the workbook.

### Sorting

This was generally well done but there needs to be clear evidence of which field the data is sorted on.

### Performing Chart Operations

Graphing was generally well done. There were issues in the labels, legends and titles. Teachers need to ensure that students create a graph that shows a comparison of at least two series of data.

The graph should also be of a reasonable size so that all information can be clearly identified.

### Extraction of Data and Criteria Range

Many candidates did not successfully perform advanced filtering with two or more criteria. Teachers must ensure that the advanced filter is part of the SBA. Evidence of the criteria used must be shown, as well as the results. The criteria range and the results must appear on the same page. A caption (heading) should be used

to clearly indicate the presence of the criteria range filter. Alternatively, a screen shot can be presented if the filter buttons are used but the criteria must be seen.

## Database Management

### Mark schemes

#### 1. Following the syllabus guidelines

Many centres submitted guidelines that did not include skills that **MUST** be tested from the syllabus. The syllabus provides the **weightings** for various tasks on page 26–27 and these must be followed.

#### 2. Submission of individual mark schemes

Teachers are reminded that graded individual mark schemes **MUST** be submitted for each student in the sample.

#### 3. Complete breakdown of marks

Teachers are reminded that individual mark/s awarded for each skill **MUST** be shown. For example;

<b>Process</b>	<b>Key Skills</b>	<b>Mark Allocation</b>
The effectiveness with which students use facilities in creating and modifying the database	Adding a new record to the resource table.	1
	Sorting the student table on last name	1
	Deleting the parent field in the Accounts table	1

#### 4. Presentation

##### Submission of projects

- Projects should be submitted securely with each section/application clearly labelled.
- Mark schemes for each section should be placed immediately before or after the section.
- All pieces of work relevant to database should be placed in this section.

#### 5. Printouts

- Students are required to print and submit copies of the DESIGN views for **tables and queries** as well as the corresponding data sheet views. It is recommended that screen shots for the design views are submitted. *See example on next page.*

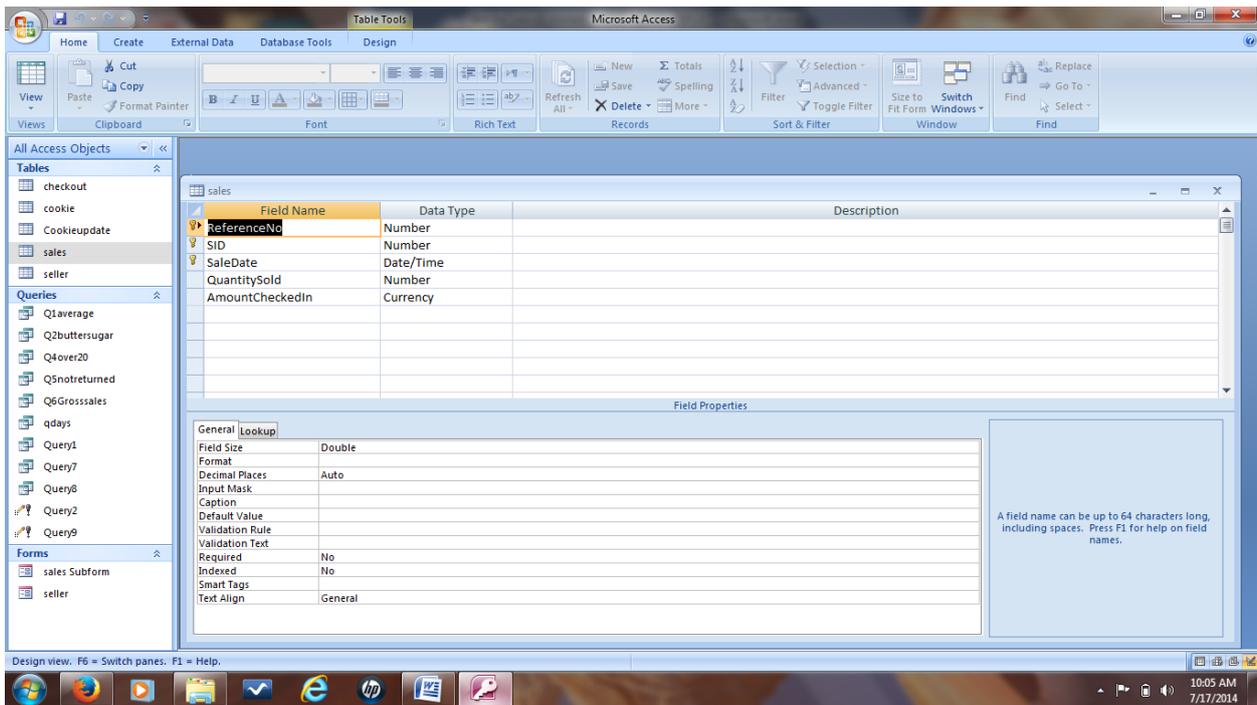


Figure 5. Example of a Screen shot of a query

## Problem Solving and Programming

This year more candidates attempted the programming section of the SBA. Improvement in the presentation of the samples was evident as students appeared to be using productivity software to create algorithms, flowcharts and trace tables.

## Problem Solution

Generally, the quality of samples has improved over the previous years. However, there is still some concern relating to the creativity applied to the problem solution and the diversity of ideas used. It was evident that templates were used in a significant percentage of the solutions received and this practice **is strongly discouraged**.

Furthermore of the samples submitted were not substantive in nature and consequently the solutions provided were too trivial.

Teachers are encouraged to find problems within the community to solve. See page 30 of the Syllabus for recommendations.

The following are some examples:

- housing solutions
- beach clean-up applications
- natural disaster projects
- hotel industry projects

## Problem Statement

There has been a general improvement in the number of candidates who submitted the problem statement. Most candidates were able to describe the solution to the problem, however some copied the actual question from the assignment and submitted it as the problem statement.

Candidates should be able to describe their solution to the problem given which should include the necessary input, processing and output requirements for the problem.

**Note that an appropriate problem statement should take the form of a paragraph and should give an indication of the necessary input, processing and output requirements for the problem.**

*For example:-*

Using the TrinBarJam Elections SBA given in the syllabus, an example of an inadequate statement would be:

“This pseudocode identifies the winning candidate of an election.”

A more appropriate problem statement would be:

“The following pseudocode is designed to find the winning candidate. It will accept the candidate’s name and amount of votes. It will determine the highest votes and output of the winner’s name.”

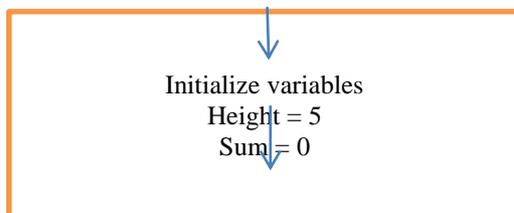
### **Flowcharts/Pseudocodes**

#### Flowcharts

There has been some improvement in the number of candidates who submitted flowcharts, however it has been noted that some candidates used incorrect symbols in flowcharting (looping, selection, flow lines and connectors). Candidates should ensure correct use of symbols and clearly show looping constructs at all times.

#### Initialization

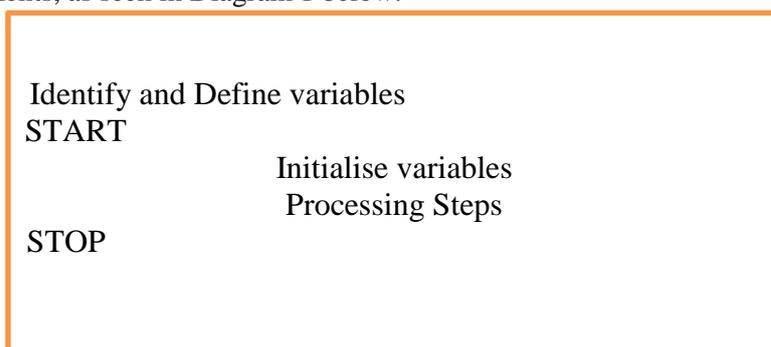
When doing *initialization* in the flowchart, variable names should be used in the symbols in addition to using general phrases. For example:



#### *Pseudocode*

It is highly recommended that candidates write the pseudocode before coding the solution. The solution/algorithm should not resemble Pascal code nor a slightly modified Pascal code.

The pseudocode solution should take the following format with variable definitions preceding the processing statements, as seen in Diagram 1 below.



### Diagram 1

Improvement in the use of START and STOP, variable names, initializing variables and the use of prompts has been noted. Most candidates were able to demonstrate storing data in variables but some were challenged to store data in arrays. In addition, many more candidates attempted to use arrays in their solutions.

### Logical use of Structures

Most candidates were able to correctly demonstrate selection and looping in the samples submitted.

### Output results

The majority of candidates were able to correctly demonstrate “output results” in their solutions.

### Trace tables

It was noted that many candidates did not identify the key variables in their solutions and did not use robust data to test their programs. This section was not well done by the majority of candidates.

The following points are noteworthy:

1. The variables in the trace table should match those identified in the pseudocode or the program.
2. Sample data used to test the solution should be robust; i.e. test both valid and invalid data for key variables.
3. Changes in variables in the table should be clearly represented.

### Program Implementation

This section was generally well done. Approximately 95 per cent of the candidates attempted this component, with the majority being awarded at least half of the marks for this section. Students must be encouraged to be creative.

To be awarded full marks for this section, candidates should ensure the following guidelines be adhered to:

- Evidence of a working program should be clearly seen through the use of screen shots.
- Candidates should ensure that their solution employs a minimum of three different data types.
- Variables should be initialized appropriately in the program.
- The project should be sufficiently substantive to demonstrate the use of
  - **Two (2)** different types of *selection* statements
  - **Two (2)** different types of *iteration* statements *with one (1)* of the iteration statements *manipulating an array*.

Some candidates were unable to demonstrate initialization in the samples submitted. Many candidates were able to demonstrate selection and repetition in their samples, but more attention must be placed on the *type of loop* that should be used for the task. For example, the use of a 'while' loop instead of a 'for' loop. More emphasis should also be placed on the *if-then-else* construct in the program.

### Documentation

While there was improvement over last year's submission, this was seen largely in the internal documentation.

Programs should be well documented: name of author, date created and a simple statement of the problem must be inserted. Process statements can also be documented. Candidates should pay close attention to layout, i.e. proper indentation and 'white spacing'.

## **GENERAL RECOMMENDATIONS**

### Length of SBA

In the area of spreadsheet formatting, much improvement is needed in order to limit printouts. Too many unnecessary printouts were submitted. Teachers and students need to concentrate more on the quality of work done, specific to the tasks. The number of printouts must be limited (at most, 25 pages inclusive of formulae sheets, the actual worksheets, advanced filter data, and charts).

Documents must be well-formatted so as to ensure good printouts. Candidates must make good use of page breaks for column adjustments to ensure that data and charts are not spread across several pages in a way that makes them difficult to understand or interpret. Teachers should avoid assigning SBAs that require the use of a large number of columns that are difficult to print.

### Presentation

The SBA report should be presented in a coherent manner. Printouts must be properly and carefully collated, secured and labelled so as to ensure good presentation. Spreadsheet printouts should be in one section, database management printouts in another section, and word processing and problem solving printouts in their separate sections.

Although the packaging and size of SBA samples has improved over the years, improvement in the presentation of the packaging of the samples is still required.

### Syllabus Guidelines for Marking SBA

Teachers are strongly urged to strictly adhere to CXC's mark scheme as provided in the syllabus. Marks should NOT be allocated to tasks that are not aligned to this mark scheme. The assignment details must also be submitted.