CARIBBEAN EXAMINATIONS COUNCIL

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

JANUARY 2013

INFORMATION TECHNOLOGY
GENERAL PROFICIENCY EXAMINATION

GENERAL COMMENTS

The January 2013 examination was the third one based on the revised syllabus for private candidates. Eight hundred and twenty-one candidates wrote the examination. Approximately 59 per cent of them obtained Grades I–III compared with 48 per cent in January 2012.

DETAILED COMMENTS

Paper 01 – Multiple Choice

This paper consisted of 60 multiple-choice questions testing all areas of the syllabus. Thirty questions tested Theory (Profile 1); 15 questions tested Productivity Tools (Profile 2) and 15 questions tested Problem Solving and Programming (Profile 3). Performance on Profile 1 was lower than 2012 with a mean score of 38 compared with 36 for 2012. Teachers and coordinators are advised to pay special attention to verification and validation, and examples to illustrate the various types.

Paper 02 – Structured Response Questions

This paper consisted of three sections with a total of 12 compulsory structured response questions. Section I consisted of six questions worth 60 marks and tested the Theory profile. Section II consisted of two questions worth 15 marks and tested the Productivity Tools profile. Section III consisted of four questions worth 45 marks and tested the Problem Solving and Programming profile.

Section I – Theory

Question 1

Part (a) tested candidates' ability to distinguish between the various components of a computer system. Some candidates gave examples of the hardware components such as keyboard, printer and monitor instead of the general terms: *control unit, secondary storage, input device, output device.*

Part (b) tested candidates' knowledge of the types of devices that may be found in specific components of the computer. Approximately five per cent of candidates did not attempt this question. No candidate gave bistable device as an answer. Those who responded mentioned either 'registers' or 'cache', which were acceptable. For Part (b) (ii), some candidates wrote 'USB' instead of *USB drive* but generally, candidates were able to name secondary storage devices. For Parts (b) (iii) and (iv), many candidates did not give examples but named the component. Overall, candidates who attempted this question obtained between five and full marks out of ten.

Question 2

Part (a) tested candidates' ability to convert binary to octal and binary to hexadecimal. This question was poorly done by the majority of candidates. Most candidates seemed unfamiliar with octal and hexadecimal and converted to binary instead. For the hexadecimal conversion, most candidates did not use *B* to represent the remainder of *11*.

Part (b) tested candidates' knowledge of IP addresses. In Part (b) (i), many candidates misinterpreted the word *network* to mean 'social network' as opposed to a *computer network.* Part (b) (ii) was well done. The majority of candidates gave the correct response as

University, East, Floor B, PC08. However, many candidates misinterpreted Part (b) (iii). It was apparent that candidates did not understand the question, resulting in them either not attempting it or converting the whole IP address of 128.8.74.3 to binary. Teachers and students should place more emphasis on this section of the syllabus.

Question 3

Part (a) tested candidates' knowledge of the term *hard copy* and its usage. Many candidates attempted this question and they seemed to know the definition of *hard copy* even though a few of the responses were vague, stating that it was 'something you can touch and feel.' These were acceptable. In some instances, candidates stated that 'a hard copy could be damaged' instead of actually specifying that *pages could be lost or misplaced*. Here too, candidates were not penalized.

Part (b) tested candidates' knowledge of compact disks (CDs). Approximately 50 per cent of the candidates were able to state the meaning of the term *CD* accurately. Incorrect responses were 'computer disk' or 'compatible disk'. For Part (i), the majority of candidates knew that *CD* was a secondary storage device. Approximately 65 per cent of the candidates were able to answer Part (b) (iv) accurately. Some candidates misunderstood the question and stated the brand names of the CDs instead of the types. The most popular response for Part (b) (v) was 'the flash memory was more expensive'. A number of the candidates stated that 'the flash memory card could be easily infected with a virus'; confusing a flash memory card with a flash drive.

Question 4

Part (a) tested candidates' knowledge of networks and the type of technology used for the various wired and wireless networks. Part (a) (i) was generally well done. The majority of candidates correctly identified local area network (LAN) as the answer. However, they incorrectly stated that LAN was 'local access network'. The responses given for Parts (a) (ii) and (iii) were quite encouraging. Some candidates mistakenly answered 'twisted pair' instead of *coaxial cable* for Part (a) (iii). A relatively large number of candidates did not attempt Part (a) (iv) and those who did, identified a transmission medium as 'fiber optic cable' rather than the type of transmission which included *broadband*, *voiceband*, *satellite*, *microwave* and *infrared transmission*. Part (a) (v) was not very popular among the candidates and very few of them were able to provide the accurate network protocol of *Wi-fi* or *Bluetooth* for the answer; candidates erroneously stated other protocols such as 'HTTP' and 'FTP'.

Part (b) tested candidates' knowledge of job responsibilities of computer professionals. The number of correct responses was understandably high. Candidates experienced the greatest difficulty matching the job responsibility for network administrator and computer engineer. The others were generally well done.

Question 5

Part (a) tested candidates' ability to describe a positive and a negative impact that Information Technology has on the music, teaching or medical profession. Candidates were able to list the positive impacts on the profession but the negative impacts posed some challenges. Some candidates failed to express any details in their responses. For example, candidates stated, 'it was easy to use' and 'faster' for positive impact and 'system crashes' and 'data loss' for negative impact. These should have been related to each profession.

Part (b) tested candidates' knowledge of hardware devices or software used in the music, teaching or medical profession. The majority of candidates answered this question. It was generally well done.

Part (c) tested candidates' knowledge of how hardware devices or software is used in the music, teaching or medical profession. Although this question was attempted by a relatively large number of candidates, most of them were awarded less than full marks since they could not adequately describe how the hardware or software was used.

Question 6

This question was not very popular among candidates although it was clear and unambiguous. From the responses given, it was evident that many candidates misunderstood what was being asked as they referred to 'word processing', 'spreadsheet' and 'databases' in their responses.

Part (a) tested candidates' knowledge of data verification, how errors can be detected and corrected. Few candidates responded correctly and a vast majority of them failed to obtain full marks. The correct response was *double-entry* for Part (a) (i) but many candidates failed to state this. For Part (a) (ii), many candidates failed to use the terms *typographical error* and *transpositional error*; instead, they chose to explain what the errors are.

For Part (iii), very few candidates were able to state that *the error can be detected when the data entered by two clerical officers or twice by the same officer* do not match. Many candidates who attempted Part (iv) inaccurately stated that 'the form needed to be returned to the student for checking' rather than a supervisor.

Part (b) tested data validation and the ability to identify appropriate methods of data validation for various situations. Performance here was also very disappointing indicating clearly that both teachers and students may be neglecting this aspect of the syllabus. For everyone's benefit, both the questions and answers are reproduced below.

The Question

A student registration system at New Age High School requires students to complete a registration form.

(a) In order to verify the data, the data from this form are keyed in by one clerical officer at the school and then re-entered by another clerical officer.

(i) Name the data verification method described above.
(ii) Describe ONE type of error that the data verification method would detect.
(iii) State how the error in (a) (ii) above is detected.
(iv) Outline how the error in (a) (ii) above can be corrected.

(b) After the data are verified, a program scans the data entered to validate the data submitted by the students. State the name of EACH validation check for EACH of the examples below:

(i) The student's name does not contain any special characters.
(ii) The student's date of birth is after 31 August 2000 but before 01 September 2001.

(iii) The student's weight is greater than 500 lb.
(iv) The student's age on the form is correct given the student's date of birth.

The Answer

(a) (i) Double-entry
(ii) Typographical or Transpositional error where the clerical officer has keyed in wrong data.
(iii) When the data keyed in by the two clerical officers do not match then either one or both is/are incorrect.
(iv) When the error is detected then a supervisor would check the original form and re-enter the data submitted by the student.

(b) (i) Data type check
(ii) Range check
(iii) Reasonableness check
(iv) (In)consistency check

Section II – Productivity Tools

Question 7

The question tested candidates' knowledge of the basic features of a database management program, more specifically data types, primary keys and queries. The majority of candidates found it difficult to provide suitable responses for the various parts of the question. More practical work using a Database Management program is needed to correct the difficulties experienced by candidates.

For Part (a), the majority of candidates provided the correct response for the field name, *Name*. However, some candidates gave inaccurate responses like 'letters', 'char', 'real', 'word' and 'general'. For the field name *DOB*, many candidates gave the correct response.

For Part (b), most candidates were able to identify *IDNo* as the correct field for the primary key.

For Part (c), the majority of candidates were able to identify the correct fields for the query. However, some candidates, in constructing the criteria for the query, used the incorrect operator, the symbol for less than (<) instead of the greater than symbol (>).

Question 8

This question tested candidates' knowledge of the basic features of a word processing program, more specifically, moving a paragraph to another part of a document, creating a new page and mail merge.

Part (a) was attempted by many candidates and was generally well done. The most common mistake occurred when candidates stated 'copy' instead of *cut* for moving the paragraph, but most candidates demonstrated their ability to perform this task.

Part (b) was not well done. Many candidates seemed to have misunderstood the question. They misinterpreted it to mean another page in the document rather than a new one that had

to be created. As a result, many of them gave in their response, 'scroll down', which was incorrect.

For Part (c), the majority of candidates failed to pay attention to the terms *word processing feature* and *personalized letter*. Consequently, the correct response, which was *mail merge* was not given.

Section III – Problem Solving and Programming

Question 9

This question tested candidates' ability to identify programming statements written in Pascal code, programming constructs and programming errors.

Pat (a) was generally well done. Most candidates were able to identify the programming language as Pascal. Candidates who gave incorrect responses stated that the programming language was 'pseudocode' or 'algorithm'.

In Part (b), the majority of candidates were able to correctly recognize the code as a sequence of statements but many of them did not attempt to offer any explanation to justify this. Where explanations were given, most candidates did not state that *the instructions would be executed once*. A few candidates were able to gain full marks.

Part (c) was not popular among candidates. For those who attempted this part, the specific function of the *Writeln* statement was often incorrectly stated as 'displaying text' or 'prompting for input.' Many candidates' responses were only partially correct. They failed to state that after the output, the cursor moves to the next line.

In Part (d), some candidates incorrectly identified the final output only (line 10) instead of showing the output from each of the *Writeln* statements which was

Enter first one
Enter second one
The result is 12

Few candidates were able to gain full marks for this part of the question. Though it was not required, a number of candidates rewrote the program given.

For Part (e), the majority of candidates did not write *Set A* and *Set B* on separate lines as instructed and therefore did not provide separate responses for each set of input values. Many candidates identified the error in Part (e) (i) as *syntax error*. For Part (e) (ii), a relatively large number of candidates were able to identify *Num 1* as the cause of the error.

Question 10

This question tested candidates' knowledge of programming languages and the steps associated with implementing a program.

Part (a) tested candidates' knowledge of low-level and high-level languages and steps associated with implementing a program. It was poorly done. Many candidates who attempted the question described the low-level and high-level languages without naming examples of them and those who provided examples named one only. More candidates were able to state examples of low-level languages than high level languages.

In Part (b), very few candidates were able to identify the correct sequence of the steps associated with implementing a program. Teachers need to ensure that students fully understand this process.

Question 11

This question tested candidates' knowledge of array and their ability to manipulate data in an array.

Part (a) was well done. Part (b) was poorly done. The required answer here was *char* or *characters*. Part (c) was also poorly done. Common responses which were inaccurate were 'ORM', 'NFORM', 'INFORM', '456' and '1,2,3,4,5'. The correct response was *FORM*.

Question 12

This question tested candidates' ability to identify syntax errors in a Pascal program. Many candidates could not demonstrate their knowledge of the purpose of the semi-colon found at the end of the statement. This produced an error. They therefore failed to state *removing the semi-colon at the end of the statement in line 6 would correct these errors*. Another error identification that posed a problem was declaring X and Y as integers. A number of candidates failed to write the line numbers of the errors as well. This resulted in loss of marks but overall the question was generally well done.

Paper 032 – Alternative to School-Based Assessment (SBA)

This paper consisted of four questions which tested the Productivity Tools and Problem Solving and Programming profiles.

Question 1 – Word Processing

This question tested candidates' knowledge of the various features of a word processing application. The question was based on a letter provided. Overall, word processing was not well done. Approximately 58 per cent of the candidates scored less than full marks for this question.

In Part (a), the majority of candidates were not able to recognize that the line spacing was 2" or that the body of the document was double-spaced. Teachers may need to practise using 1.5 and double-line spacing with their students. Many candidates, as well, did not demonstrate having knowledge of the term *justification* as it relates to word processing. They were therefore not able to gain full marks for this question.

Part (b) was generally well done. Some responses did not relate to the letter but gave other formatting features.

In Part (c), most candidates were able to explain how to remove the underline from the text.

Part (d) asked candidates to indicate whether four features *header*, *footer*, *footnote*, or *endnote* were found in the memo. A large percentage of candidates were unable to distinguish between the terms given and therefore they were unable to identify the features that were found in the letter.

In Part (e), candidates performed poorly. The majority did not state that the *find and replace* feature was the one that should be used. Some of the candidates who stated the correct feature failed to mention that the word *election* needed to be selected and r*eplace all* chosen.

For Part (f), candidates were unable to transfer their knowledge of inserting a picture to explain in detail how it can be done. This resulted in them not performing well on this part of the question.

In Part (g), candidates were unable to state that the name of the document that contains the merge fields is known as the *primary document* or *main document*.

For Part (h), approximately half of the candidates who attempted this question scored the full two marks. Others were unable to identify the number of merge fields needed in the document or the correct names of the merge fields.

Question 2 – Spreadsheet

This question tested candidates' knowledge of the various features of a spreadsheet application. The question was based on a chart which was provided.

Part (a) was generally well done by most candidates. In Part (b), candidates were able to name other types of charts that were appropriate for representing the data. For Part (c), the majority of candidates was able to state the title of the chart. However, a few candidates stated the name of the vertical axis instead of the horizontal axis.

In Part (d), many candidates were able to identify the purpose of the chart. For Part (e), the majority of candidates was able to write the data that was used to create the chart. However, a few misread the values from the chart and wrote '1000' instead of *10000*.

For Part (f), a large number of candidates gave good responses. Some however named an incorrect range of values or combined the *sum* function with the + operator. Part (g) was not well done. The majority of candidates only named one column range (No. of Voters) as the solution while others did not demonstrate knowledge of the concept of a *range*.

The majority of candidates attempted Part (h) and approximately 85 per cent of the responses were poor. Many candidates experienced difficulty in writing down the requirements of a criterion for filtering the data. In some instances, a wrong value was given in the condition or candidates gave the response for Part (i). Some attention should be paid to teaching this topic.

In Part (i), a large number of candidates who attempted this question wrote the district letters only as the response and not the complete answer which included the *no. of voters*.

For Part (j), a very small percentage of candidates who attempted this question were able to give a correct response. Common errors in responses were "error", "##" and "no result".

Question 3 – Database Management

This question tested candidates' knowledge of the various features of a Database Management application. The question was based on a database with two tables. A large number of candidates attempted this question.

Part (a) was fairly well done. Some candidates were unable to differentiate between fields and records. A few did not understand the concepts and multiplied 10 by 3 and gave 30 as their answer. A substantial number of candidates indicated Pascal programming data types for Part (a) (ii) and therefore gave responses such as 'char', 'string', 'alphabet' and 'integer'. A few candidates also listed one data type for the two fields and some candidates stated that there was no primary key since there was no unique field in the table. For (a) Part (iii), approximately half of the candidates gave one field as the primary key instead of the two *DCODE + PTYPE*. Teachers need to ensure that candidates are taught that more than one field can make up a primary key. Most candidates were able to provide the correct response for Part (a) (iv).

For Part (b), a large percentage of the candidates were able to give an accurate response.

The majority of candidates answered Part (c) accurately although many of them just wrote 'Sum of Places'. A number of candidates, however, were not able to state that the POLLING table was the one used in the query for Part (b) (ii). Instead, they stated what a query is used for.

For Part (d), some candidates seemed confused with the meaning of > and some candidates stated what a query is generally used for rather than stating what the query was specifically used for in this instance. A number of candidates gave only one table for Part (d) (ii) instead of two. Most of the candidates identified the correct number of records for Part (d) (iii).

Many candidates gave inaccurate responses for Part (e) (i). They named 'currency', 'number' and 'integer' as their responses. The correct response was *calculated field*. For Part (e) (ii), the majority of candidates was able to give the correct response although some of them inaccurately stated 'money'.

In Part (f) (i), some candidates were able to state the field which was used to group the records but some listed all three fields. This occurred for Part (f) (ii) as well. Many candidates left out Part (f) (iii) and some selected the SUMMARY line from the report for their response. The majority of candidates was able to identify the title of the report for Part (f) (iv). This part was generally well done.

Question 4 – Programming and Problem Solving

This question tested candidates' knowledge of concepts associated with Problem Solving and Program Design and Implementation using the programming language, Pascal.

In Part (a), most candidates were able to clearly state the data types. However, some had difficulty. Very few candidates recognized the statement as a declaration. The majority of candidates understood when a syntax error can occur and therefore scored well on this question but many of them were unable to identify when the error would occur.

Many candidates were unable to correctly interpret Part (b) (i) that asked them to state the variable that *lg* represents, but were able to recognize the initial value of *lg*. However, the majority of candidates was able to identify the control structure and the line numbers where they were used.

Many candidates attempted Part (c) and responded fairly well. Some candidates demonstrated lack of knowledge of the concept of *trace table*.

A small percentage of candidates attempted Part (d) but did poorly. Teachers need to ensure that students are taught the proper symbols used in constructing a flow chart as many were confused as to what symbols to use for the various statements.