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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INFORMATION TECHNOLOGY

Paper 02 – General Proficiency

2 hours 15 minutes

15 MAY 2014 (a.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

1. This paper consists of THREE sections and a total of TWELVE questions. Candidates MUST answer ALL questions in all THREE sections.
2. Number EACH answer correctly in the answer booklet.
3. Code is to be written in the programming language, Pascal.

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SECTION I

THEORY – 60 marks

Answer ALL questions.

1. (a) Arrange the following units of storage from the largest to the smallest, with the largest capacity at the top of the list and the smallest capacity at the bottom.

- Megabyte (MB)
- Kilobyte (KB)
- Terabyte (TB)
- Gigabyte (GB) **(4 marks)**

(b) For EACH of the following tasks, state the name of the hardware device that performs the given task.

(i) Performs calculations within the CPU

(ii) Stores program instructions during the execution of the program

(iii) Implements the sequencing of instruction execution in the CPU

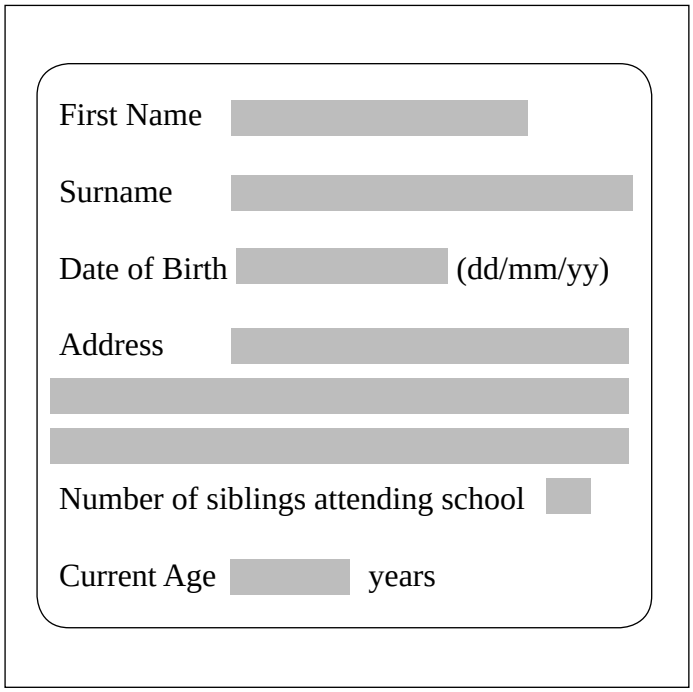
(iv) Reads data written in magnetic ink from a document

(v) Produces audio output from a computer

(vi) Captures graphical data directly from a document for input to a computer **(6 marks)**

Total 10 marks

2. (a) When a child enters a school for the first time, data is collected and entered by the clerical staff on a screen similar to the image below.



The following validation checks are used to validate the data entered in the different fields in the data entry form given above. Outline the purpose of EACH type of check on the field identified below.

(i) First Name: Data type check

(ii) Number of siblings attending school: Reasonableness check

(iii) Date of Birth: Range check

(iv) Current Age: Consistency check **(8 marks)**

(b) State ONE difference between verification and validation. **(2 marks)**

Total 10 marks

3. The following is an excerpt from an advertisement of a computer system.

CPU	Intel® Celeron® B815 Dual Core (2M Cache, 1.60 GHz)
RAM	2GB DDR3 1066MHz Dual Channel RAM (8GB MAX)
VIDEO GRAPHICS	Intel HD Graphics
HARD DRIVE	320GB 5400RPM SATA
OPTICAL DRIVE	8 × DVD + CD Player & Burner (Burns both DVDs & CDs)
DISPLAY	15.6” HD Widescreen LED display (1366 × 768)
WIRELESS	IEEE 802.11b/g/n
SOUND	Built In Speakers, Headphones
PORTS	3 USB 2.0
DIMENSIONS	Height — 1.3”, Width — 15”, Depth — 10”
WEIGHT	5.73 lb
POWER	AC 120/230 V (50/60 Hz) — 65W, 6 cell Battery
SOFTWARE	Microsoft Windows 7 Home Premium 64-bit Edition
	Adobe Acrobat Reader, Adobe Flash Player, McAfee Internet Security Suite (Trial), Roxio Easy Creator Starter, Windows Media Player, Microsoft Office 2007 (Full Version)

Answer the following questions using the information given in the above advertisement.

(a) Name the type of processor. **(1 mark)**

(b) State the speed of the processor. **(1 mark)**

(c) Name the type of hard drive. **(1 mark)**

(d) State the resolution of the display. **(1 mark)**

(e) Name TWO output devices. **(2 marks)**

(f) State the number of flash drives that can be simultaneously connected to the computer. **(1 mark)**

(g) Provide ONE piece of information which indicates that the computer is a laptop. **(1 mark)**

(h) Name the type of operating system included with the computer system. **(1 mark)**

(i) Name ONE general purpose software included with the computer system. **(1 mark)**

Total 10 marks

4. Applications can be classified as industrial, scientific, commercial, process control, and automation information processing systems.

(a) For each application listed below, identify the class of information processing systems.

(i) Banking industry — managing user accounts

(ii) Weather forecasting — predicting the weather

(iii) Household appliance — sequencing wash cycle tasks in a washing machine

(iv) Manufacturing industry — using robots to assemble car components **(4 marks)**

(b) For the past 30 years, the XY Company has been processing data using a computer system.

(i) In the earlier days, data were collected and stored on a data tape that only allowed the data to be stored one after the other. During processing, the data were accessed in the order in which they were entered. State the method of file organization implemented and the type of access used during processing. **(2 marks)**

(ii) In later years, data were stored by a device that allowed the data to be stored anywhere on the media. However, the data were still stored in the same way, that is, one after the other. A file structure was created that allowed the data to be accessed in any order. State the method of file organization implemented and the type of access used during processing. **(2 marks)**

(iii) Currently, the data are stored in files in which the records are ordered according to a key value. State the type of data access used during processing. **(1 mark)**

(iv) New devices are now installed that allow specific data to be captured directly from the input document. State the name for this type of input document. **(1 mark)**

Total 10 marks

5. (a) Name TWO types of cable/wired media. **(2 marks)**

(b) Name TWO types of wireless media. **(2 marks)**

(c) State the difference between simplex and half-duplex data transmission. **(2 marks)**

(d) Distinguish between an intranet and an extranet. **(2 marks)**

(e) State ONE reason why an organization would choose to establish an extranet. **(1 mark)**

(f) State ONE disadvantage of an extranet. **(1 mark)**

Total 10 marks

6. The local government office in your district collects government revenue from residents in the district, and organizes and administers the maintenance of government offices and roads. A small office staff is employed to perform the administrative functions required by the office. This staff utilizes a local area network to assist in the performance of their functions.

(a) State ONE method that is used to prevent members of the public from having physical access to the computers. **(1 mark)**

(b) State ONE software method that can be used to prevent unauthorized staff from accessing sensitive data on the network. **(1 mark)**

(c) State FOUR ways that the intergrity of the data can be destroyed. **(4 marks)**

(d) State TWO steps in a procedure that can be used to restore online data that is lost. **(2 marks)**

(e) Data on hours worked by employees are entered by the clerical staff. Outline ONE method used to verify the accuracy of the data entered. **(2 marks)**

Total 10 marks

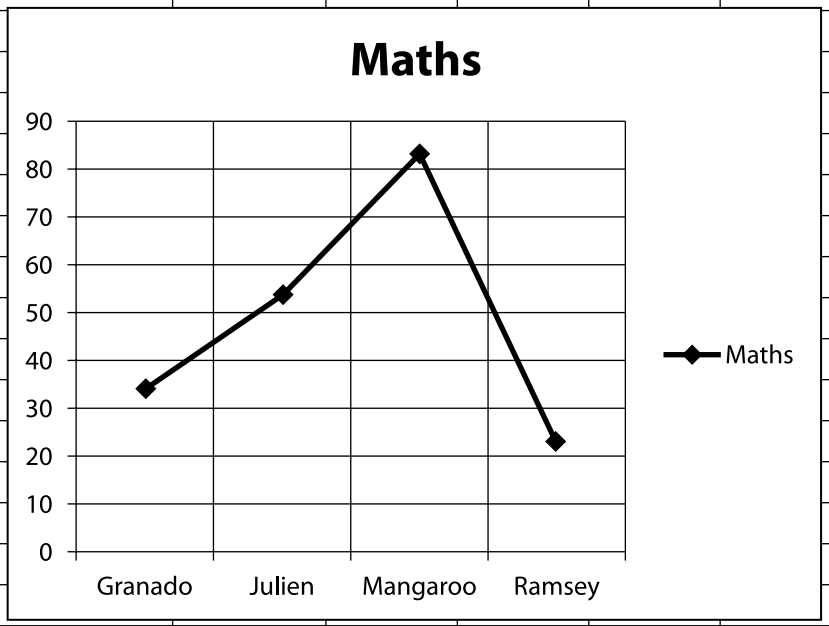
SECTION II

PRODUCTIVITY TOOLS – 15 marks

Answer ALL questions.

7. Answer the following questions based on the spreadsheet below.

	A	B	C	D	E	F
1	FirstName	Surname	Maths	English	IT	Total
2	Seeta	Granado	34	36	56	
3	Selwyn	Julien	54	41	62	
4	Mala	Mangaroo	83	75	72	
5	Ronald	Ramsey	23	95	75	
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(a) State the address of the cell which contains 62. **(1 mark)**

(b) State the function to be placed in cell F4 to calculate the total marks for "Mala Mangaroo". **(2 marks)**

(c) State the function to be placed in cell C6 to calculate the highest mark in Maths. **(2 marks)**

(d) Name the type of chart displayed in the spreadsheet. **(1 mark)**

(e) State the range of the data displayed on the *x* axis of the chart. **(1 mark)**

Total 7 marks

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8. The Lambeau Village Secondary School uses a database named LAMBEAU with two tables named STUDENTS and PARENTS to store data on students and their parents. Extracts of these two tables are shown below.

TABLE 1: STUDENTS

StudentNo	FirstName	Surn+ame	DateofBirth	House
04060101	Teresa	Davis	04-06-2001	Lara
01110002	Nigel	Hosein	01-11-2000	Richards
12040101	Lorna	Knight	12-04-2001	Lloyd
18090901	Anil	Narine	18-09-2009	Greenidge

TABLE 2: PARENTS

FirstName	Surname	Parent	StudentNo	Occupation
Lynette	Davis	Mother	04060101	Teacher
Rudy	Davis	Father	04060101	Electrician
Hafiz	Hosein	Father	01110002	Programmer
Shairoon	Hosein	Mother	01110002	Housewife
Kurk	Knight	Father	12040101	Mason
Lydia	Lee	Mother	12040101	Housewife
Ravi	Narine	Father	18090901	Machinist
Shuvani	Narine	Mother	18090901	Secretary

(a) State the data types of the StudentNo and DateofBirth fields of the STUDENT table. **(2 marks)**

(b) Identify the most appropriate field in the STUDENTS table that may be used as the primary key. **(1 mark)**

(c) Indicate the primary and secondary fields that are used to sort the data in the PARENTS table. **(2 marks)**

(d) State the name of the field that would be used to join the two tables. **(1 mark)**

(e) Write a query to find ALL students in "Lara" House. **(2 marks)**

Total 8 marks

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SECTION III

PROBLEM SOLVING AND PROGRAMMING – 45 marks

Answer ALL questions.

9. (a) Arrange the following steps in problem solving in the correct order, with the first step at the top of the list and the last step at the bottom.

- Develop and represent algorithm
- Determine the most efficient solution
- Test and validate the solution
- Define the problem
- Propose and evaluate solutions **(5 marks)**

(b) State the most appropriate data type for each of the following types of values.

(i) The number of family members

(ii) A person's height in metres

(iii) A person's gender (M or F)

(iv) A person's first name **(4 marks)**

Total 9 marks

10. (a) Arrange the following steps in implementing a program in the correct order, with the first step at the top of the list and the last step at the bottom.

- Link program
- Maintain program
- Create source code
- Execute program
- Compile program **(5 marks)**

(b) State ONE difference between a first generation language and a second generation language. **(1 mark)**

(c) State TWO differences between a machine language code and a high level language code. **(2 marks)**

(d) State ONE benefit to programmers in using a fourth generation language over a third generation language. **(1 mark)**

Total 9 marks

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11. (a) The first row of the trace table below shows the values in the variables before entry into the loop. Copy and complete the trace table to find the result of the following algorithm.

```
Read N
Set Times to 1
Set Product to 1
Repeat
        Set Product to Product *Times
        Set Times to Times + 1
Until N = Times
```

N	Product	Times
4	1	1

(4 marks)

(b) Write a pseudocode algorithm to read in TWO different numbers and print the smaller number. **(8 marks)**

Total 12 marks

12. The pseudocode for a program that reads in the marks of 10 students into an array, MARKS, and calculates the average mark is as follows.

```
Read marks into array MARKS
Initialize variables
Calculate sum of marks in the array
Calculate average
Print average
```

(a) Write a Pascal declaration for the array, MARKS. **(5 marks)**

(b) Write Pascal declaration statements for the variables SUM and AVERAGE. **(2 marks)**

(c) Write Pascal code to initialize the variable SUM. **(1 mark)**

(d) Write Pascal code to calculate the sum. **(7 marks)**

Total 15 marks

END OF TEST

IF YOU FINISH BEFORE TIME IS CALLED, CHECK YOUR WORK ON THIS TEST.