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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN SECONDARY EDUCATION CERTIFICATE® EXAMINATION

INFORMATION TECHNOLOGY

Paper 02 – General Proficiency

2 hours 15 minutes

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. Write your answers in the spaces provided in this booklet.
3. DO NOT write in the margins.
4. Code is to be written in the programming language, Pascal.
5. If you need to rewrite any answer and there is not enough space to do so on the original page, you must use the extra lined page(s) provided at the back of this booklet. **Remember to draw a line through your original answer.**
6. **If you use the extra page(s) you MUST write the question number clearly in the box provided at the top of the extra page(s) and, where relevant, include the question part beside the answer.**

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO.

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SECTION I

THEORY – 60 marks

Answer ALL questions.

1. The board of PG high school has donated a computer system to the school.

(a) (i) State TWO additional peripheral devices that can be used with the computer system.

.....

.....

(2 marks)

(ii) Identify ONE way in which EACH device mentioned in Part (a) (i) above can be used.

.....

.....

(2 marks)

(b) (i) State THREE types of application software that could be used on the computer.

.....

.....

.....

(3 marks)

(ii) Identify ONE way in which EACH application stated in Part (b) (i) above can be used.

.....

.....

.....

(3 marks)

Total 10 marks

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2. (a) For EACH of the following devices, indicate the communication mode used to transmit data:

(i) Walkie-Talkie .....

(ii) Telephone .....

(iii) Radio .....

(3 marks)

(b) Classify EACH of the following methods as (S) Software restriction or (P) Physical restriction:

(i) Use of passwords on files .....

(ii) Biometric scanner to access a computer room .....

(iii) Store files in fire/waterproof cabinets .....

(iv) Encryption of files .....

(v) Use of a firewall once connected to the Internet and intranet

.....

(5 marks)

(c) List TWO ways in which sensitive data can be misused.

.....

.....

(2 marks)

Total 10 marks

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3. (a) Name the TYPE of software that performs EACH of the following tasks:

(i) Compresses the size of a file

.....

(ii) Converts program instructions into machine code one line at a time

.....

(iii) Provides a medical diagnosis based on the patient's illness

.....

(iv) Controls machine tools and related machinery in the manufacturing of car parts

.....

(v) Contains a number of applications that run as a single program

.....

(5 marks)

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(b) Consider the following scenarios.

Scenario 1: Raymond communicates with the computer by typing specific commands to get some tasks done.

Scenario 2: Mary communicates with the computer by using the mouse to click on a picture on the screen representing the task she wants to do.

Scenario 3: The cashier communicates with the computer by touching pictures on the screen representing items being sold in the store.

(i) Identify the type of user interface indicated in

Scenario 1: .....

Scenario 2: .....

Scenario 3: .....

(3 marks)

(ii) Name the type of software which provides the user interface.

.....

(1 mark)

(iii) State the scenario number which indicates a hardware interface.

.....

(1 mark)

Total 10 marks

4. Answer the following questions based on the six figures shown below.



Figure 1



Figure 2



Figure 3



Figure 4



Figure 5



Figure 6

(a) Which of the figures above describe EACH of the following types of media?

(i) Magnetic storage media

.....

.....

.....

(3 marks)

(ii) Optical storage media

.....

(1 mark)

(iii) Neither optical nor magnetic storage media

.....

.....

(2 marks)

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(b) Which of the figure(s) use the following access methods?

(i) Sequential access .....

(ii) Direct access .....

(2 marks)

(c) For each of the following, state whether it describes optical storage media or magnetic storage media.

(i) More storage capacity .....

(ii) Faster data access .....

(2 marks)

Total 10 marks

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5. Write down the correct number of the task that corresponds to the device component in the spaces provided.

Task

1. Converts paper-based text to digital form
2. Marks candidates' responses on a multiple-choice examination
3. Produces a hard copy document
4. Used for playing a car racing game on the computer
5. Turns on the light when someone enters the room
6. Contains 'boot up' instructions
7. Draws lines in an architectural design
8. Modulates and demodulates signals
9. Reads data containing information on a product
10. Reads digits specially printed on a cheque

Number	**Device/Component**
_____	Sensor
_____	Joystick
_____	Pad and tablet
_____	MICR
_____	Barcode reader
_____	Modem
_____	OCR
_____	ROM
_____	Printer
_____	OMR

Total 10 marks

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6. (a) The decimal number 53 is represented by 00110101. Find the two's complement 8-bit representation of the decimal number -53. Show all working.

.....

.....

.....

.....

(2 marks)

(b) Find the BCD of a signed decimal number +579.

.....

.....

.....

(4 marks)

(c) The hexadecimal representation of a decimal number is 5D. Find the decimal number.

.....

.....

(2 marks)

(d) The ASCII representation of the character "M" is 1001101. Determine the ASCII representation of the character "O".

.....

.....

.....

(2 marks)

Total 10 marks

SECTION II

PRODUCTIVITY TOOLS – 15 marks

Answer ALL questions.

7. The Teachers' Training College has prepared a spreadsheet showing the number of teachers trained during the period 2012–2014. Answer the following questions based on the spreadsheet given below.

	A	B	C	D	E	F
1	TEACHERS' TRAINING COLLEGE					
2						
3						
4	Specialization	2012	2013	2014	Total	
5	Early Childhood	300	600	800	1,700	
6	Primary	1,500	2,600	3,000	7,100	
7	Secondary	1,200	1,800	2,200	5,200	
8	Technical	150	320	540	1,010	
9	Total	3,150	5,320	6,540	15,010	
10						

(a) State the cell address that contains the total number of teachers for the three years.

.....

(1 mark)

(b) In 2012, it cost $3,000 to train each teacher. Write a formula to compute the total cost for training teachers in 2012.

.....

(2 marks)

(c) What format has been applied to the numeric data in the spreadsheet?

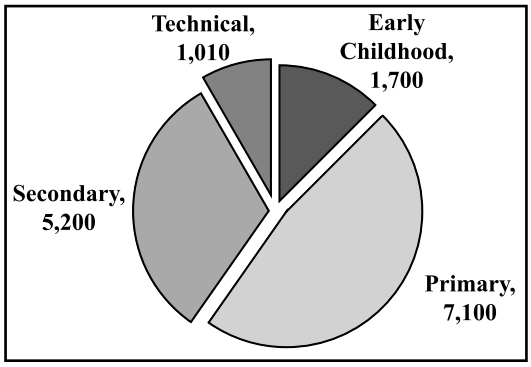
.....

(1 mark)

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(d) The chart below was produced from the data in the spreadsheet.



(i) State the type of chart shown.

.....

(1 mark)

(ii) State the range of data used to construct the chart.

.....

.....

(2 marks)

Total 7 marks

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8. The Technical Council has created a database with one table named SKILL to store information on persons certified as Assessors and Trainers. Part of the database is shown below.

skill

LAST NAME	FIRST NAME	SPECIALIZATION	GENDER(M/F)	DOE(MM-DD-YYYY)
Smith	Paul	Assessor	M	10/11/2012
Allen	Mary	Trainer	F	08/23/2013
Ally	Iqbal	Trainer	M	06/10/2012
Blair	Sheldon	Assessor	M	02/25/2013
Persaud	Miriam	Assessor	F	01/05/2012

(a) Name TWO data types used in the skill table.

.....

.....

(2 marks)

(b) If the data were sorted by the DOE(MM-DD-YYYY) field in ascending order, state the last name of the person who would be at the top of the sorted table.

.....

(1 mark)

(c) (i) Write a query to find all males (M) who are Assessors in the table below.

SPECIALIZATION	GENDER (M/F)

(2 marks)

(ii) How many records will be displayed in the result of the query?

.....

(1 mark)

(d) A report was created from the table and the records were grouped by a field. State the names of TWO appropriate fields which could be used to group the records.

.....

.....

(2 marks)

Total 8 marks

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SECTION III

PROBLEM SOLVING AND PROGRAMMING – 45 marks

Answer ALL questions.

9. The Management Committee for the city has approved the following property tax charges for the next year:

- Property tax is 5% of the value of the property.
- A discount of 1% of the property tax is given if the property was owned for 15 or more years.

Write Pascal code to do the following:

(a) Declare TWO constants which can be used in the program.

.....

.....

.....

(2 marks)

(b) Declare TWO meaningful variables which can store the data to be input to the program.

.....

.....

.....

(2 marks)

(c) Compute the property tax to be paid for property owned for 25 years. Use the variables and constants declared in Parts (a) and (b) above.

.....

.....

.....

(2 marks)

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(d) In the space provided below, draw a flowchart for the program. **(9 marks)**

Total 15 marks

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10. (a) The following represents examples of programming code from different programming languages:

EX1: X: = X + 20;

EX2: ADD X, 20

EX3: 1100 1110

EX4:
```
SELECT tax
FROM SALARY
WHERE BONUS> 50 000
```

State the generation of the programming language for EACH example.

EX1: .....

EX2: .....

EX3: .....

EX4: .....

(4 marks)

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(b) State the technical term(s) for EACH of the following descriptions:

(i) TWO errors which can occur when a program is executed

.....

.....

(ii) A document which contains instructions for the user of the program

.....

(iii) An error which can occur when the source code is being compiled

.....

(iv) The process of locating and fixing errors in a program

.....

(v) Code created after a program is compiled successfully

.....

(6 marks)

Total 10 marks

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11. A one-dimensional array named FAMILY is used to store the number of children in each of four families. Write Pascal code to do the following:

(a) Declare the array FAMILY.

.....

.....

(4 marks)

(b) Assign six children to the fourth family.

.....

.....

(2 marks)

(c) Initialize the variable CHILDREN to zero.

.....

.....

(1 mark)

(d) Add the number of children in the four families and store the total in a variable named CHILDREN.

.....

.....

.....

.....

(3 marks)

Total 10 marks

12. A room is monitored by a temperature sensor and a smoke sensor. These sensors are connected to an alarm. If the temperature is too high, the alarm is sounded. If smoke is detected, then the alarm is sounded.

Suppose:

- High temperature or presence of smoke is represented by 1
- Normal temperature or no smoke is represented by 0
- Sounding the alarm is represented by 1
- No alarm is represented by 0

(a) Complete the following table which will determine when to sound the alarm.

Temperature	Smoke	Sound Alarm
1	0	
1	1	
0	0	
0	1	

(4 marks)

(b) Using the template provided below, construct a trace table to test the following segment of an algorithm:

```
a = 1
b = 1
WHILE (a<10) DO
        a = a + 3
        Print a
        b = b + 2
        Print b
END WHILE
```

Step	a	b

(6 marks)

Total 10 marks

END OF TEST

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

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