

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. Number **EACH** answer correctly in the answer 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.**

SECTION I

THEORY – 60 marks

Answer ALL questions.

1. (a) Convert the decimal number 78 to hexadecimal. **All working must be shown.**

.....

.....

.....

.....

.....

.....

(2 marks)

- (b) The BCD of a signed decimal number is 1011 0011 0111 1000. What is the decimal number?

.....

.....

.....

.....

.....

.....

(4 marks)

- (c) The ASCII representation of the character "K" is 1001011. What is the ASCII representation of the character "H" ?

.....

.....

.....

.....

(2 marks)

(d) The two's complement 8-bit representation of a decimal number is 11000100. What is the decimal number?

.....

.....

.....

(2 marks)

Total 10 marks

Application	System

2. Consider the following devices listed from D1 to D5:

- D1 — Pressure sensor
- D2 — Plotter
- D3 — Headphone
- D4 — Scanner
- D5 — Joystick

(a) From the above list, state the devices that are classified as

(i) input devices

.....

.....

(ii) output devices.

.....

.....

(5 marks)

(b) For EACH device listed in the table below, give an example of an application that would be suitable for the device. Write your answer in the table.

Device	Application
Pressure sensor	
Plotter	
Headphone	
Scanner	
Joystick	

(5 marks)

Total 10 marks

3. (a) State the name of the hardware component that performs EACH of the following tasks:
- (i) Stores the 'boot up' program
.....
 - (ii) Executes the sequencing of instructions in the CPU
.....
 - (iii) Stores data to be used later
.....
 - (iv) Allows data to be entered into the computer
.....
 - (v) Displays the results of processing to the user
.....

(5 marks)

(b) An excerpt of the specifications of a computer system is listed below.

Optical Drive: 8X DVD+/-RW

Memory: 4GB DDR3 SDRAM

Hard Drive: 1TB 7200rpm SATA Hard Drive

Display: 14.0" HD (1366 × 768) LED

Processor: Intel® Core™ i5 Processor (2.5GHz)

Ports: 5 USB 3.0

From the specifications provided, identify the

(i) resolution of the monitor

.....

(ii) size of the hard drive

.....

(iii) size of the RAM

.....

(iv) type of processor

.....

(v) speed of the optical drive.

.....

(5 marks)

Total 10 marks

4. An operating system is a special software that enables users to interact with the computer system.

(a) State ONE example of an operating system software used on a desktop computer.

.....
(1 mark)

(b) State TWO types of software user interface other than a graphical user interface (GUI). Indicate the main input device used in EACH.

.....
.....
.....
.....
.....
.....
.....
.....
(4 marks)

(c) State ONE example of a hardware user interface.

.....
(1 mark)

(d) Identify TWO characteristics or features found in a GUI.

.....
.....
(2 marks)

(e) Apart from providing the user interface, state TWO other functions of an operating system software.

.....
.....
(2 marks)

Total 10 marks

5. Data has been collected for a survey and entered into a computer using a data entry form.

(a) State TWO methods that can be used to ensure that the data is entered accurately into the computer.

.....
.....
(2 marks)

(b) Explain how the TWO methods named in (a) above ensure that the data is entered accurately into the computer.

.....
.....
.....
.....
(2 marks)

(c) State the names of THREE checks and explain how they work to ensure that the data entered is valid.

.....
.....
.....
.....
.....
.....
(6 marks)

Total 10 marks

6. The Ministry of Education has set up a video conference laboratory in a school and installed a high-speed Internet connection.

(a) List FOUR hardware devices that are required for this laboratory.

.....
.....
.....
.....

(4 marks)

(b) Write down the number of the term indicated in Column X (1 to 6) that corresponds to the most appropriate meaning in Column Y.

Column X
1. UPLOAD
2. VOIP
3. HOTSPOT
4. URL
5. LAN
6. FTP

Number	Column Y
	Link computers in the computer lab
	Rules for transferring files over the internet
	Address of a website
	Public area where you can access the Internet via Wi-Fi
	Making phone calls over the Internet
	Transfer files from your computer to a web server

(6 marks)

Total 10 marks

GO ON TO THE NEXT PAGE



SECTION II

PRODUCTIVITY TOOLS – 15 marks

Answer ALL questions.

7. BJ Stores, a local chain store with branches around the country, has prepared the spreadsheet below showing sales for the period 2013–2015. Answer the following questions based on the spreadsheet.

	↓ A	B	C	D	E	F
1	BJ STORES					
2	SALES: 2013–2015					
3						
4	Branch	2013	2014	2015	Total	2016
5	GT	1,250	1,190	1,490	3,930	1639
6	EC	750	680	1,100	2,530	1210
7	WC	500	400	1,010	1,910	1111
8	EB	800	700	1,200	2,700	1320
9	BCE	300	650	900	1,850	990
10	Total	3,600	3,620	5,700	12,920	6270
11						

- (a) State the name of the feature used in the spreadsheet to align the text “BJ STORES” across the columns used in the spreadsheet.

.....
(1 mark)

- (b) Write the function to find the maximum YEARLY Total for the period 2013–2015.

.....
(2 marks)

- (c) It is projected that the 2016 sales for each branch will increase by 10% over the 2015 sales. Write the formula to compute the 2016 projected sales for the BCE branch.

.....
(2 marks)

(d) The sales figures in the spreadsheet have been formatted. State the format used.

.....
(1 mark)

(e) If the spreadsheet is sorted in ascending order by the **total sales** for each branch, which branch will be at the top of the spreadsheet?

.....
(1 mark)

Total 7 marks

Branch	Product	Quantity	Price	Total Sales
Branch A	Product X	100	10.00	1000.00
Branch B	Product Y	200	5.00	1000.00
Branch C	Product Z	50	20.00	1000.00
Branch D	Product W	150	6.67	1000.50
Branch E	Product V	300	3.33	1000.00

Product	Branch	Quantity	Price	Total Sales
Product X	Branch A	100	10.00	1000.00
Product Y	Branch B	200	5.00	1000.00
Product Z	Branch C	50	20.00	1000.00
Product W	Branch D	150	6.67	1000.50
Product V	Branch E	300	3.33	1000.00

(i) Which field was used to sort the records?
.....
(1 mark)

(ii) Which field was used to sort the records?
.....
(1 mark)

Total 8 marks

8. A department has created a database with one table named STOCK to store computer and related equipment in the department. A part of the database is shown below.

STOCK				
CODE	EQUIPMENT	MANUFACTURER	DOP (mm-dd-yyyy)	WARRANTY (YEARS)
G1-012	Printer	Canon	11/14/2008	3
H1-135	System Unit	Dell	06/10/2009	3
H2-005	Monitor	Dell	08/10/2009	1
H3-001	Printer	HP	03/12/2010	3
H3-115	Printer	HP	04/17/2011	1
P2-120	UPS	APC	07/15/2010	1
P2-178	Stabilizer	APC	03/15/2010	1

- (a) Name TWO data types **other than** the TEXT data type used in the stock table.

.....
.....

(2 marks)

- (b) State the field MOST appropriate for use as the primary key and indicate the reason for your choice.

.....
.....
.....

(2 marks)

(c) A query was created on the STOCK table and the result of the query is shown below.

Query2		
EQUIPMENT	DOP(mm-dd-yyyy)	WARRANTY (YEARS)
Printer	03/12/2010	3
Printer	11/14/2008	3
System Unit	06/10/2009	3

State the criterion used for the query.

.....
(2 marks)

(d) The report below was generated from the table.

ITEMS REPORT

MANUFACTURER	DOP (mm-dd-yyyy)	CODE	EQUIPMENT	WARRANTY (YEARS)
APC	3/15/2010	P2-178	Stabilizer	1
	7/15/2010	P2-120	UPS	1
Canon	11/14/2008	G1-012	Printer	3
Dell	6/10/2009	H1-135	System Unit	3
	8/10/2009	H2-005	Monitor	1
HP	3/12/2010	H3-001	Printer	3
	4/17/2011	H3-115	Printer	1

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(i) State the field used to group the records.

.....
(ii) Which field was used to sort the records?

.....
(2 marks)

Total 8 marks

SECTION III

PROBLEM SOLVING AND PROGRAMMING – 45 marks

Answer ALL questions.

9. The Minister of Finance announced a 5% salary increase for all public servants with effect from 1 January 2015. The tax-free allowance for the year 2015 is \$60,000 and the tax is 20% of the taxable salary. To compute the tax, a computer with the following program loaded has been set up at the tax booth to assist public servants.

Line	Codes
1	Program Public_Servant;
2	CONST
3	tax_rate = 0.2;
4	VAR
5	new_monthly_sal, old_monthly_sal, new_yearly_sal, tax2015 : real;
6	Begin
7	Write('Enter your old monthly salary : ');
8	Readln(old_monthly_sal);
9	new_yearly_sal := (old_monthly_sal * 1.05) * 12;
10	Writeln('Your Total Salary for 2015 is : ', new_yearly_sal : 8: 2);
11	If new_yearly_sal <= 60000 then
12	tax2015 := 0 else
13	tax2015 := (new_yearly_sal - 60000) * tax_rate;
14	writeln('Your tax for 2015 is : ', tax2015: 8: 2);
15	End.

- (a) State the name of the control structure used in the program and indicate the line numbers.

.....

.....

(2 marks)

(b) Draw a flowchart to represent the program.

The program is designed for developing a payroll program for an organization. The program will use a loop to process the data of the employees. The flowchart should show the steps to process the data of the employees. The flowchart should include the following steps: 1. Start 2. Input the number of employees. 3. Loop to process each employee's data. 4. Output the total payroll. 5. End.

- INPUT
- OUTPUT
- PROCESS
- STORE
- DISPLAY
- END
- START
- STOP

Write the missing words in the boxes given in the flowchart below.

Number	Box
1	Start
2	Input the number of employees
3	Loop to process each employee's data
4	Output the total payroll
5	End

(c) Indicate the value of the constant used in the program and state what the value represents.

.....
.....

(2 marks)

(d) State the name of the variable which contains tax paid by public servants for 2015. What is the data type for this variable?

Name of variable:

Data type:

(2 marks)

Total 15 marks

10. An array named OMEGA is used to store the values of three integers. Write Pascal code for EACH of the following:

(a) Declare the array named OMEGA.

.....

(4 marks)

(b) Assign the values 5 and 10 to the first and second locations of the array respectively. (Use two Pascal statements).

.....
.....

(4 marks)

(c) Add the values in the first and second locations of the array and store the sum in the third location of the array.

.....

(2 marks)

Total 10 marks

11. Read the paragraph that follows. From the group of capitalized words given, determine the missing word that BEST fits the numbered space.

John, a programmer, is responsible for developing a payroll program for an organization. He constructed a 1 using symbols to represent the 2 of the program. John then wrote the 3 code for the payroll program using the Pascal programming language. He then needed to 4 the program to check for 5 errors. Two errors were highlighted. John then had to 6 the program to locate and fix the errors. He proceeded to 7 the program which “hanged” and produced no results indicating that there was a 8 error. Those errors were located and corrected and the program did what it was supposed to do, indicating that there were no 9 errors. John then created 10 documentation with instructions to the end users on how to use the program.

- ALGORITHM
- EXECUTE
- LOGIC
- SYNTAX
- COMPILE
- EXTERNAL
- RUN-TIME
- DEBUG
- FLOWCHART
- SOURCE

Write the missing word next to the correct number in the table given below.

Number	Word
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	

Total 10 marks

12. (a) In the table below, write numbers 1 to 6 to indicate the correct order of steps that correspond to the problem-solving activities shown below.

Step Number	Activity
	Write an algorithm
	Test and debug the program
	Analyse the problem
	Write the program
	Test the algorithm
	Identify and define the problem

(6 marks)

- (b) For EACH of the following programming languages, state the generation (first to fourth) to which it belongs. Write your answers in the table below.

	Language	Generation
(i)	Structured Query Language (SQL)	
(ii)	Pascal	
(iii)	Machine Language	
(iv)	Assembly Language	

(4 marks)

Total 10 marks

END OF TEST

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