FORM TP 2016084

TEST CODE **01229020**

MAY/JUNE 2016

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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"*" Barcode Area "*"
Sequential Bar Code

SECTION I

THEORY – 60 marks

Answer ALL questions.

1. Vickey bought a computer and needs help in understanding the type of software that is installed.

(a) Explain the difference between 'application software' and 'system software'.

.....

.....

.....

.....

.....

.....

(4 marks)

(b) Categorize the following software as system or application software:

EXCEL	
LINUX	

(2 marks)

(c) State TWO examples of utility software and outline the purpose of EACH.

	Example 1	**Example 2**
Utility software		
Purpose		

(4 marks)

Total 10 marks

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2. (a) A company packages 10 000 eggs per day.

(i) State TWO advantages of using a robot (or robotic arm) over using a manual method to carry out this process.

.....

.....

.....

.....

(2 marks)

(ii) Apart from loss of jobs, state ONE disadvantage of using a robot (or robotic arm) over using a manual method.

.....

.....

(1 mark)

(iii) State ONE type of sensor that the robot (or robotic arm) should have. Give ONE reason why this sensor would be useful when packaging the eggs.

Sensor: .....

Reason: .....

(2 marks)

(iv) A barcode sticker is placed on each package of eggs. State TWO types of data that are contained in the barcode.

.....

.....

(2 marks)

(b) State ONE other industrial application that uses a robot (or robotic arm).

.....

(1 mark)

(c) Outline ONE job function that is critical as a result of the implementation of robotics in industry.

.....

.....

(2 marks)

Total 10 marks

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3. (a) Find the binary coded decimal representation of –165.

(4 marks)

(b) The two's complement 8-bit representation of a decimal number is 11110100. What is the decimal number? Show all working.

(2 marks)

(c) The ASCII code for the letter A is 41 in hexadecimal. What is the binary representation of the ASCII code for the letter E? Show all working.

(4 marks)

Total 10 marks

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4. A school has acquired ten computers and related peripherals to set up a computer laboratory. The school was advised to connect the computers and peripherals in a network.

(a) State the type of network that should be used to link the computers and peripheral devices in the computer laboratory. Give a reason for your answer.

.....

.....

.....

(2 marks)

(b) List TWO benefits of networking the computers and peripheral devices in the computer laboratory.

1: .....

2: .....

(2 marks)

(c) The school was also advised that a firewall is needed. Explain the purpose of a firewall.

.....

.....

.....

.....

(2 marks)

(d) List TWO transmission media that can be used to link the computers in the laboratory.

1: .....

2: .....

(2 marks)

(e) You need to send a file with confidential data to a friend via the Internet. List TWO measures that could be used to secure the file.

1: .....

2: .....

(2 marks)

Total 10 marks

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5. (a) State the name of the computer personnel who performs the following tasks:

(i) Maintains an organization's website

.....

(ii) Fixes and maintains computer hardware

.....

(iii) Develops web service applications for an organization

.....

(iv) Writes code to create software programs

.....

(4 marks)

(b) State the most suitable file access method to be used in the following applications and provide ONE reason for your answer:

(i) Payroll application

.....

.....

.....

(2 marks)

(ii) Point of sale (POS) application

.....

.....

.....

(2 marks)

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(c) Outline TWO differences between a website and a webpage.

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(2 marks)

Total 10 marks

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6. (a) Data from a paper-based form are being entered into the computer by a data entry clerk. List TWO types of data entry errors which could occur.

Error 1: .....

Error 2: .....

(2 marks)

(b) State TWO verification checks which may be done to ensure that the data entered are correct.

Verification check 1: .....

Verification check 2: .....

(2 marks)

(c) The data entry form has a field to store the age of students attending a secondary school. Using the table below, state THREE validation checks that can be applied to the age field and explain what EACH check does.

Validation checks	What each check does

(6 marks)

Total 10 marks

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SECTION II

PRODUCTIVITY TOOLS – 15 marks

Answer ALL questions.

7. The Staff Welfare Department of an organization has prepared the following database table showing employees who would receive long service awards this year. The database table is named SERVICE.

TABLE: SERVICE

EmpNo	Department	Years	Award
A100	Agriculture	12	Cash
A200	Agriculture	30	Medal
B100	Bursary	16	Cash
C100	Arts	15	Cash
C110	Library	25	Medal
L100	Library	22	Certificate
M100	Maintenance	23	Medal
M110	Maintenance	28	Medal
N100	Sciences	18	Certificate
N110	Sciences	14	Cash

(a) State the data types for the **Years** and **EmpNo** fields in the SERVICE table.

.....

(2 marks)

(b) The records in the SERVICE table were sorted in ascending order on the Award field. State the EmpNo of the record that would be at the top of the sorted table.

.....

(1 mark)

(c) Identify TWO fields that could be used to group the records in a report.

.....

(2 marks)

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(d) State the MOST appropriate field which could be used as the primary key. Indicate the reason for your choice.

.....

.....

.....

(2 marks)

(e) A query was created to show all employees with more than 20 years of service. How many records will be displayed when the query is executed?

.....

(1 mark)

Total 8 marks

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8. The following spreadsheet shows the number of workers in various sectors of the economy whose ages range from 20 to 60.

	A	B	C	D	E	F	G	H
1		Age Group						
2	**Sector**	**20-29**	**30-39**	**40-49**	**50-60**	**Total_sec**	**Percentages**	
3	Agriculture	12,000	5,000	8,900	3,500	29,400	25.28%	
4	Mining	13,000	8,400	2,500	1,400	25,300	21.75%	
5	Forestry	3,000	9,400	6,500	1,200	20,100	17.28%	
6	Manufacturing	1,500	3,700	8,200	2,000	15,400	13.24%	
7	Tourism	2,500	5,200	3,800	1,500	13,000	11.18%	
8	Transportation	1,200	6,900	3,200	1,800	13,100	11.26%	
9	**Total_age**	33,200	38,600	33,100	11,400	116,300	100.00%	
10								

(a) The formula **=F3/F9** was entered in cell **G3**.

(i) What type of cell referencing was used in **F9**?

.....

(1 mark)

(ii) Explain why this type of cell referencing was used.

.....

.....

.....

(2 marks)

(b) A pie chart is to be created. Each sector (slice) of the pie chart will represent the total number of workers in the various age groups and also indicate the name of the age group. State the data range and the category labels range to be used to create the pie chart.

.....

.....

(2 marks)

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(c) Write the functions to find the following:

(i) The average of the sector totals

.....

(1 mark)

(ii) The maximum of the age group totals

.....

(1 mark)

Total 7 marks

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SECTION III

PROBLEM SOLVING AND PROGRAMMING – 45 marks

Answer ALL questions.

9. (a) The following table shows lines of code from three types of programming languages.

Complete the table to indicate the type of programming language and the generation to which EACH sample of code belongs.

Code	Program Instruction	Type of Language	Generation
A	Add Y		
B	89 F8 A9 01 00 75 06 6B C0		
C	X := X + Y		

(6 marks)

(b) Insert the numbers 1 to 4 to indicate the correct steps that correspond to the following program implementation activities.

Step Number	Activity
	Compiling
	Creating source code
	Linking object code
	Creating executable code

(4 marks)

Total 10 marks

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10. (a) Complete the following trace table using X = 5, Y = 10 and Z = 3 for the following algorithm:

```
Read X
Read Y
Read Z
X = X + Y
Y = X + Z
Z = X + Y + Z
Print X, Y, Z
```

Line	X	Y	Z
1	5	–	–
2			
3			
4			
5			
6			

(5 marks)

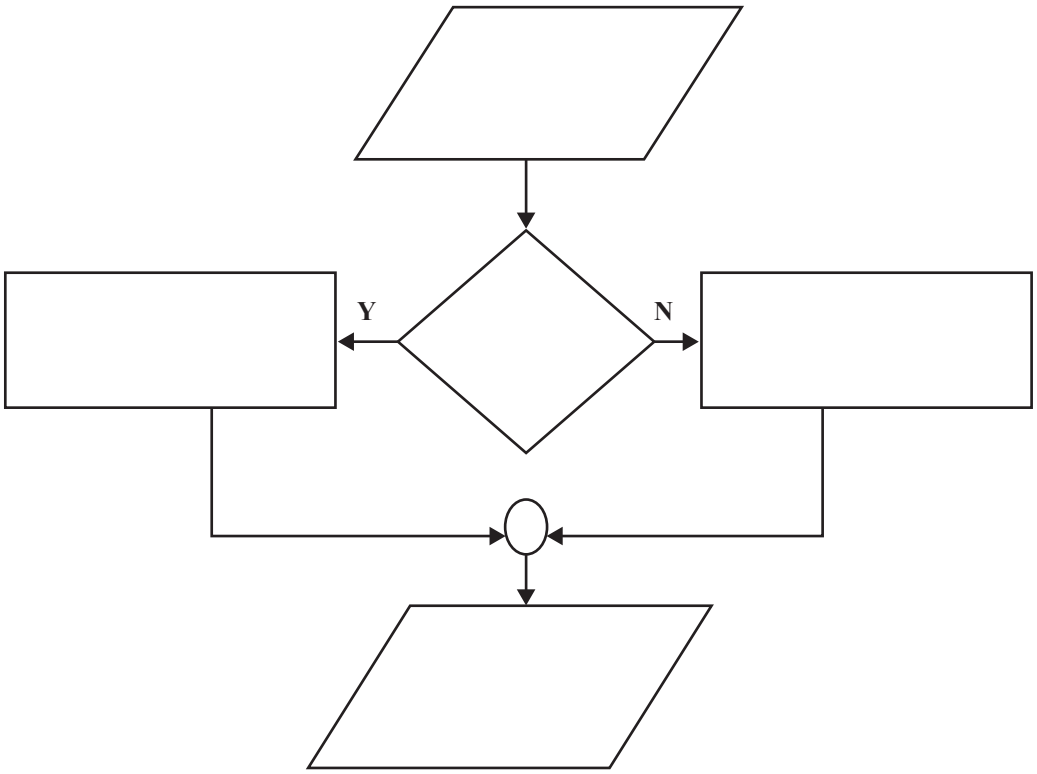
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(b) Consider the following program segment:

```
Readln(salary);
If salary <= 5000 then
    tax := 0
else
    tax := (salary - 5000) * 0.25;
Writeln (tax);
```

Complete the flowchart below by writing appropriate program code from the segment above in the corresponding symbols.



(5 marks)

Total 10 marks

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11. (a) State the Pascal data type to store EACH of the following values:

34.276 .....

–37 .....

Mango .....

(3 marks)

(b) Each of the following program statements is incorrect. Rewrite each statement using correct Pascal code.

Firstletter := M; .....

Const rate :=0.20; .....

Taxrate := 5%; .....

Var scores: array(1..5) of integer; .....

Probability := .35; .....

(5 marks)

(c) What type of error would occur when EACH of the following lines of Pascal code are executed?

(i) c = a +b;

.....

(1 mark)

(ii) d := c/0;

.....

(1 mark)

Total 10 marks

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12. Write a program named SWAP to do the following:

- Prompt the user to enter two unequal integers separated by a space.
- Read the numbers entered and store them in two variables named num1 and num2 respectively.
- Check if num1 is greater than num2. If yes, swap num1 and num2, else print "num1 is less than num2" .
- Print the values of num1 and num2 separated by a space.

Total 15 marks

END OF TEST

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

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