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CARIBBEAN EXAMINATIONS COUNCIL
ADVANCED PROFICIENCY EXAMINATION

INFORMATION TECHNOLOGY

UNIT 1 – PAPER 02

$2\frac{1}{2}$ hours

13 MAY 2009 (a.m.)

INSTRUCTIONS TO CANDIDATES

1. This paper consists of **THREE** sections and **NINE** questions.
2. Answer **ALL** questions.



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SECTION I – FUNDAMENTALS OF INFORMATION TECHNOLOGY

Answer ALL questions from this section.

1. Information Technology involves the use of both data and information.
- (a) Explain the term Information Technology, giving ONE example. [3 marks]
 - (b) Discuss TWO ways in which Information Technology can be used to provide timely delivery of services in High Schools in the Caribbean region. [4 marks]
 - (c) Data may be either qualitative or quantitative.
 - (i) Explain these TWO types of data. [4 marks]
 - (ii) A hotel website consists of a discussion board where guests share views on their experience at the hotel. The website also features the total number of visitors per year. Identify TWO appropriate pieces of data that may be found on this website and state the type of EACH piece of data identified. [4 marks]

Total 15 marks

2. Data are considered the input to processing, and information is considered the output.
- (a) Give TWO scenarios of information being generated, clearly indicating the input-processing-output relationship. [6 marks]
 - (b) State the importance of the information produced in ONE of your scenarios given in (a). [1 mark]
 - (c) The Animal Clinic currently uses a manual information processing system for tracking the animals they treat. BRIEFLY explain how EACH step in the manual information processing system below can be achieved using an automated information processing system.
 - Step 1 – Use a log book to record data about each animal, such as name, age and type.
 - Step 2 – At the end of each month, statistics are generated, such as total number of a given type of animal.
 - Step 3 – The statistics generated in Step 2 are then presented pictorially.
 - Step 4 – A report is sent by mail to the Regional Society for the Prevention of Cruelty to Animals (RSPCA). [8 marks]

Total 15 marks



- 3 -

3. Wikis and Online libraries are both popular means of conducting research on the web.
- (a) Explain these TWO web-based sources of information. [4 marks]
 - (b) Universities have taken a clear position that references for academic research from wikis will NOT be accepted. Discuss why universities would need to take such a position. [4 marks]
 - (c) John is an accountant at Chelsea Manufacturing Company Limited. He is approached by his general manager and told that the company will be implementing an Information Technology solution to improve the efficiency of the Accounts Department.
 - (i) List the THREE types of tools used in Information Technology. [3 marks]
 - (ii) For EACH type of tool identified in (c) (i), give ONE example. [3 marks]
 - (iii) Justify the use of EACH tool identified in (c) (ii), in the Accounts Department. [6 marks]

Total 20 marks

SECTION II – INFORMATION TECHNOLOGY SYSTEMS

Answer ALL questions from this section.

4. Every Information Technology System includes four distinct components. Hardware is one of the four components.
- (a) Name the other THREE components of an Information Technology System. [3 marks]
 - (b) Explain the purpose of any TWO components of an Information Technology System that you have identified in (a), giving ONE example in EACH case. [4 marks]
 - (c) Input and output devices are two types of hardware. Explain how these TWO devices can be used in a Point of Sale System. [4 marks]
 - (d) Two types of printers are laser and dot matrix. Give ONE situation in which
 - (i) a dot matrix printer is MORE appropriate for use than a laser printer
 - (ii) a laser printer is MORE appropriate than a dot matrix printer. [4 marks]

Total 15 marks

5. Software is used to provide the computer with instructions.
- (a) Explain the function of Application Software. [2 marks]
 - (b) Many organizations are beginning to see advantages in using Open Source Software and are moving towards its adaptation. Discuss TWO challenges that such organizations will confront with the use of Open Source Software. [4 marks]
 - (c) Explain any TWO types of Information Systems. [6 marks]
 - (d) Explain the importance of the analysis phase in the Software Engineering process. [3 marks]

Total 15 marks

6. Computer networks provide us with the facility to communicate and share resources such as data.
- (a)
 - (i) Draw diagrams to illustrate TWO of the following topologies: STAR, RING, and BUS. [6 marks]
 - (ii) State ONE advantage and ONE disadvantage of each of the THREE topologies listed in (a) (i). [6 marks]
 - (b) Explain ONE benefit of a virtual private network (VPN). [2 marks]
 - (c) You have been asked by the Ministry of Education to develop a Human Computer Interface for software to facilitate training. Discuss TWO user characteristics that you would need to consider in the development of the interface. [6 marks]

Age appropriate

Total 20 marks

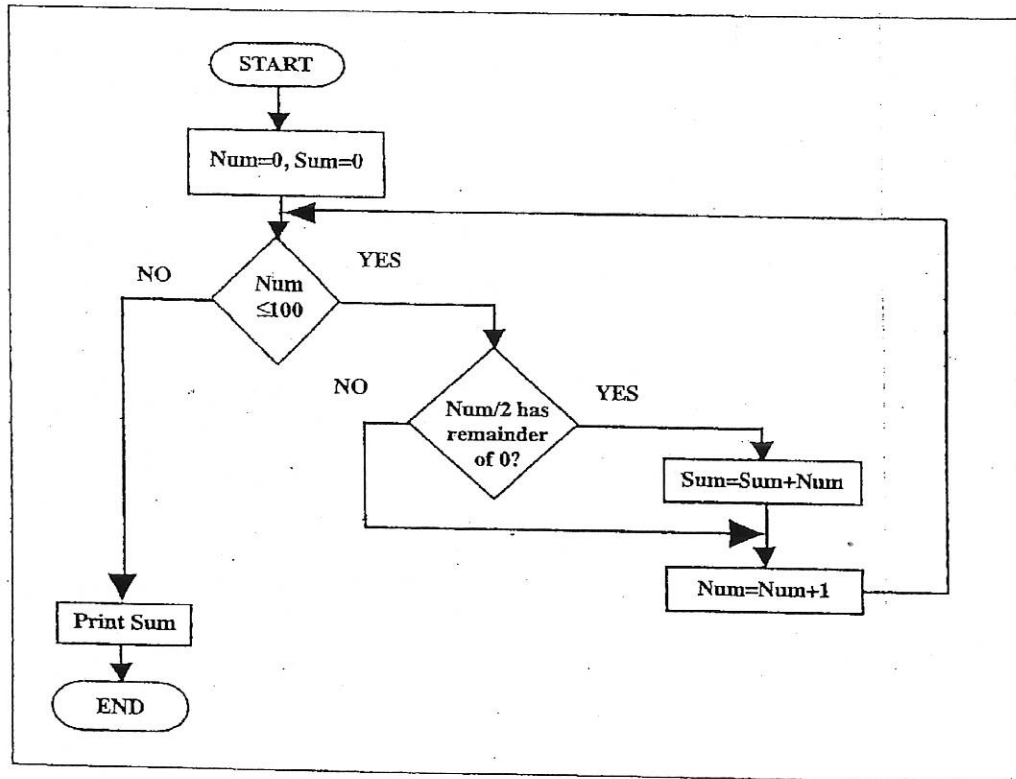
SECTION III – INFORMATION AND PROBLEM SOLVING

Answer ALL questions from this section.

7. Your history teacher wants to create a simple program to automate the calculations of grades for students in the class. He has asked you to create the algorithm to be used by a programmer that he will employ.
- (a) State THREE stages of the problem-solving process. [3 marks]
 - (b) Explain the importance of an algorithm in the problem-solving process. [2 marks]
 - (c) State THREE properties that your algorithm must have for it to be considered a 'well designed' algorithm. [3 marks]
 - (d) The programmer has told the teacher that he can write the program using an assembly language or a procedural language. The teacher is now confused.
 - (i) Explain the difference between EACH of the types of languages named in (d). [5 marks]
 - (ii) State with reason, ONE advantage of using a procedural language to write the program. [2 marks]

Total 15 marks

8. Algorithms may be represented in different ways. Pseudocode and flowcharts are two such ways. Study the flowchart below and answer the questions that follow.

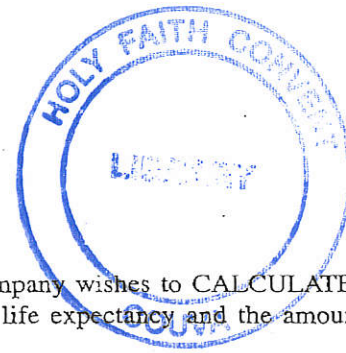


- (a) Explain what problem the flowchart solves. (You are not required to provide the output) [4 marks]
- (b) Write the pseudocode to represent the algorithm illustrated by the flowchart. [7 marks]
- (c) The following pseudocode was intended to calculate the sum of all numbers from 0 to 100 inclusive. When coded an infinite loop was created. Explain why the algorithm resulted in an infinite loop, and clearly state how it could be corrected.

```
Begin
  Count=0
  Sum=0
  While (Count<=100)
    Sum=Sum+Count
  End
```

[4 marks]

Total 15 marks



9. The mortgage department of a housing development company wishes to **CALCULATE** the monthly payments for each applicant, based on his/her life expectancy and the amount of money to be borrowed by the applicant.

- (a) For any **FIVE** pieces of information on the applicant listed below, specify whether the information is **essential**, **desirable** or **cosmetic** for **CALCULATING** the applicant's monthly mortgage payment. Justify your selection.

- Name of applicant
- Current contact information
- Date of Birth
- Picture of the applicant
- Medical Records
- Model of Housing Unit Selected
- Preferred Location
- Cost of the Unit

[10 marks]

- (b) Sketch and state the purpose of any **TWO** of the following Data Flow Diagram symbols: Entity, Process, Data Store, Data Flow. [4 marks]

- (c) The employees of the housing development company submit their time cards to the Payroll Department for processing. The payroll system determines the employee's weekly salary and generates a pay slip as well as a cheque for each employee. It also generates accounting information for the Accounts Department. Draw the **CONTENT LEVEL** data flow diagram to illustrate this. [6 marks]

Total 20 marks

END OF TEST