

FORM TP 2013209



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CARIBBEAN EXAMINATIONS COUNCIL

CARIBBEAN ADVANCED PROFICIENCY EXAMINATION®

INFORMATION TECHNOLOGY

UNIT 1 – Paper 02

2 hours 30 minutes

06 MAY 2013 (p.m.)

READ THE FOLLOWING INSTRUCTIONS CAREFULLY.

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.

- 1.** Information technology (IT) is the application of computer science to solve real life problems.
- (a) Outline ONE example of IT being used in EACH of the following:
- (i) Health care [2 marks]
 - (ii) Education [2 marks]
- (b) For EACH aspect of computer science identified below, describe its function in IT solutions.
- (i) Programming [2 marks]
 - (ii) Databases [2 marks]
- (c) Information technology involves the use of data. Distinguish between the following forms of data:
- (i) Qualitative and quantitative [2 marks]
 - (ii) Sampled and detailed [2 marks]
- (d) Construct a diagram which illustrates the relationship among data, knowledge and information. [3 marks]
- Total 15 marks**
- 2.** Information processing is integral to information technology.
- (a) The information processing cycle is a sequence of four main activities performed by a computer.
- (i) Identify the FOUR activities. [4 marks]
 - (ii) Construct a diagram to illustrate the information processing cycle. [3 marks]
- (b) Information to be used in decision making should exhibit certain characteristics.
- (i) State TWO of these characteristics. [2 marks]
 - (ii) With reference to a commercial banking system, explain how EACH of the characteristics identified in (b) (i) is important for decision making. [4 marks]
- (c) Explain the phrase 'garbage in, garbage out' or 'GIGO' as used in the context of information technology. [2 marks]

Total 15 marks

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3. Computer hardware and software characteristics and capabilities have changed over the last 30 years.

(a) Identify ONE way in which EACH of the following has changed.

(i) Size of hardware [1 mark]

(ii) Processor speed [1 mark]

(b) Outline the function of EACH of the following tools in the transmission of information.

(i) Modem [2 marks]

(ii) Antenna [2 marks]

(iii) Web browser [2 marks]

(c) Magdalene owns a small business and wishes to improve its efficiency by computerizing some aspects of the business. She has recently purchased an office productivity suite.

For EACH business task identified below, specify the tool in the productivity suite that would be **most appropriate** for use by Magdalene. **Justify your answer.**

(i) Preparing letters for clients [3 marks]

(ii) Preparing accounting statements [3 marks]

(iii) Managing inventory/stock [3 marks]

(iv) Creating a company newsletter [3 marks]

Total 20 marks



SECTION II – INFORMATION TECHNOLOGY SYSTEMS

Answer ALL questions.

4. An information technology system or information system can be described as a collection of components used to produce quality information.
- (a) Apart from users, identify THREE other components of an information technology system. [3 marks]
 - (b) Outline the role of users as a component of an information technology system. [2 marks]
 - (c) There are many different types of information technology systems. One example is a management information system (MIS).
 - (i) Identify TWO other types of information technology systems. [2 marks]
 - (ii) Describe the function of EACH of the information technology systems identified in (c) (i) above. [4 marks]
 - (d) Explain, using an appropriate example, why it is useful to distinguish between the categories of users in an information technology system. [4 marks]

Total 15 marks

5. (a) Define the terms 'authentication' and 'authorization'. [2 marks]
- (b) Usability and security are two factors that must be considered in the design of computer interfaces.
- A user interface is to be designed for an automated teller machine (ATM). It is intended that the ATM will be used by both sighted and visually impaired persons.
- For EACH of the following technologies, describe ONE design feature that can be incorporated to assist the visually impaired in using the ATM.
- (i) Card reader [2 marks]
 - (ii) Data entry by the user (for example, PIN [personal identification number], account selection, dollar amounts) [2 marks]
 - (iii) Commands and results from the system to the user (for example, account balance, request for PIN) [2 marks]
- (c) Describe TWO additional security features, other than the use of a PIN, that would be appropriate in an ATM. [4 marks]
- (d) State THREE features of a strong password. [3 marks]

Total 15 marks

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6. The World Wide Web (WWW) is an interconnection of hypertext documents accessible to Internet users.

(a) Write EACH of the following acronyms in full and explain its function in the context of the WWW:

(i) HTML [3 marks]

(ii) HTTP [3 marks]

(iii) URL [3 marks]

(b) State ONE example of a domain name and ONE example of an IP address. [2 marks]

(c) Explain why a domain name is more frequently used than an IP address for locating a website. [4 marks]

(d) The TCP/IP is an important aspect of the internet. The diagram below illustrates this protocol in layers. Explain the purpose of EACH layer.

Application
Transport (TCP)
Internetworking (IP)
Network access
Physical

[5 marks]

Total 20 marks



SECTION III – INFORMATION AND PROBLEM SOLVING

Answer ALL questions.

7. The problem solving process has several stages, which when followed may lead to an optimal solution to a problem.
- (a) Discuss the importance of the 'analyse the problem' stage. **[3 marks]**
 - (b) Discuss the purpose of TWO tools used in the 'analyse the problem' stage. **[6 marks]**
 - (c) Information available for a given problem solving scenario may be categorized in one of the ways listed below. Explain any TWO of the following categorizations.
 - (i) Extraneous
 - (ii) Desirable
 - (iii) Essential
 - (iv) Cosmetic **[4 marks]**
 - (d) Carlos finds a flyer while waiting at the bus stop. The flyer advertises a method of earning US \$5 000 per week for life by investing US \$10 using a credit card at the website listed on the flyer. Carlos is very interested in the opportunity but wishes to get additional information.

Explain why the website listed may not be a trustworthy source of information for Carlos. **[2 marks]**

Total 15 marks

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8. Algorithms are useful tools in the problem solving process because they require the user to identify a systematic approach to the solution of the problem.

(a) Examine the algorithm shown below.

```
sum=0
counter=0
for x =1 to x=20
    if x mod 3 =0
        counter=counter+1
        sum=sum+x
    x=x+1
z=sum/counter
print counter
print z
```



- (i) Explain the function of the algorithm shown above. [3 marks]
 - (ii) State the output of the algorithm. [2 marks]
 - (iii) Design a flow chart to represent this algorithm. [6 marks]
- (b) The following algorithm was designed to accept numeric values representing temperature readings for a week. It should then calculate the average of temperatures entered and print that value. However, the algorithm results in a program which freezes the computer on which it is running.

```
count=0
sum=0
average=0
temperature=0
while temperature is not 999
    read temperature
    sum=sum+temperature
average=sum/count
print average
```

- (i) Explain the source of the problem in the algorithm. [2 marks]
- (ii) Rewrite the algorithm with the necessary corrections. [2 marks]

Total 15 marks

9. After algorithms have been developed, it is common to develop programs based on these algorithms.
- (a) Use a diagram to illustrate the stages in the program development process. [4 marks]
 - (b) Explain EACH of the following programming paradigms, giving ONE example of a language in EACH case.
 - (i) Object oriented [2 marks]
 - (ii) Functional [2 marks]
 - (iii) Procedural [2 marks]
 - (c) Assembly programming is not popular for the development of typical application software, but it is still quite useful.
 - (i) Identify TWO advantages of assembly programming over high-level programming. [2 marks]
 - (ii) Identify TWO disadvantages of using assembly programming as compared with high-level programming. [2 marks]
 - (d) Any program written in a typical high-level programming language contains various control structures. Explain EACH of the control structures listed below.
 - (i) Sequence [2 marks]
 - (ii) Selection [2 marks]
 - (iii) Iteration [2 marks]

Total 20 marks

END OF TEST

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