

FORM TP 2010205



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CARIBBEAN EXAMINATIONS COUNCIL
ADVANCED PROFICIENCY EXAMINATION

INFORMATION TECHNOLOGY

UNIT 1 – PAPER 02

2½ hours

12 MAY 2010 (a.m.)



INSTRUCTIONS TO CANDIDATES

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



SECTION I – FUNDAMENTALS OF INFORMATION TECHNOLOGY

Answer ALL questions.

1. Information processing refers to the transforming of data into information through the use of computers and other technologies.
- (a) Information Technology (IT) is one of the five major computing disciplines. List THREE other disciplines of Computing. [3 marks]
- (b) The local tourism authority of a Caribbean country plans to use questionnaires to identify the leisure preferences of the citizens. Their responses will be processed by an automated information system and the findings presented to tourism officials.
- (i) Suggest THREE data capture methods that could be used for entering the data collected on the questionnaires. [3 marks]
- (ii) For EACH method identified in (b) (i), explain why it is suitable to capture the data on the questionnaire. [3 marks]
- (iii) Assume that the questionnaire was designed in a way which allowed respondents to give their answers in 'free text' format. Give TWO problems that might occur when entering 'free text' format. [2 marks]
- (iv) You are asked to make changes to the questionnaire to eliminate or minimize the problems given in (b) (iii). Suggest TWO ways, other than 'free text', in which respondents could be allowed to give their answers to questions. Justify your response. [4 marks]

Total 15 marks

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2. The Internet gives users access to global information and instant communication. Access can occur anytime from a computer in any location.

- (a) Other than the World Wide Web, name THREE other services that the Internet offers to individuals. [3 marks]
- (b) Some households use dial-up connections to access the Internet. Discuss TWO high-speed broadband connections that a householder or small business may use to access the Internet. [6 marks]
- (c) The CEO of a multinational company is concerned about the rising costs of office accommodation for staff. In discussions with colleagues, he was told about a telecommunication technology that would allow staff to work from home, but still be in contact with their office using computers.
 - (i) Propose a telecommunication strategy that the CEO could implement, which would allow the staff to work at home. [1 mark]
 - (ii) Other than the computer, list THREE Information Technology tools or services that would be required by an employee, working from home, to connect to the company's network via the Internet. [3 marks]
 - (iii) An employee wishes to work on a word-processing document that is stored on a file server at the office. The employee prefers to download the document to her computer at home. Which Internet service can be used? Justify your response. [2 marks]

Total 15 marks



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3. Organizations and individuals use information to improve the quality of their decision making. Inadequate or poor-quality information is likely to lead to bad decisions.

(a) Explain what is meant by the term 'knowledge' in the context of information technology. [2 marks]

(b) Using an example, explain how EACH of the following characteristics of information could aid in decision making.

- (i) Accuracy
- (ii) Completeness
- (iii) Timeliness

[6 marks]

(c) Information may be categorized in a number of ways. Figure 1 shows a table of some categories of information.

Category	Type of Information	Explanation
SOURCE	Internal	Information generated from data produced within the entity
	External	Information generated from data produced outside the entity
NATURE	Quantitative	Information largely or wholly numeric
	Qualitative	Information largely or wholly text based
LEVEL	Strategic	Information used by top executives to aid in decision-making
	Tactical	Information used by middle managers to aid policy implementation
	Operational	Information used by supervisors or junior managers to aid day-to-day operations
TIME	Historical	Information relating to events, transactions, etc that occurred in the past
	Current	Information relating to ongoing or now events, transactions, etc
	Future	Information relating to events, transactions, etc that are to come, e.g. information from forecasting
USE	Planning	Information used to make strategies about future needs
	Control	Information used to monitor current procedures and to take corrective action when necessary
	Decision	Information used to support decision making
STRUCTURE	Disaggregated	Information presented with data items intact
	Aggregated	Information summarized to make it more concise

Figure 1

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- (i) Using the category 'LEVEL' in the table in Figure 1, give ONE example of the **type of information** used at EACH level. [3 marks]
- (ii) A purchase order is produced within a company. Using ANY FIVE categories in Figure 1, state the **type of information** to be found on the purchase order for EACH of the categories selected. [5 marks]
- (iii) Another category, FORM, is to be added to the table. One **type of information** in this category is 'Written', with the explanation being "information presented in the written format". For this new category, suggest TWO other **types of information**, and an explanation for EACH of these. [4 marks]

Total 20 marks

SECTION II – INFORMATION TECHNOLOGY SYSTEMS

Answer ALL questions in this section.

4. Information Technology systems typically have four major components: hardware, software, network and users.
- (a) Without software, a hardware device will not function. A new scanner is supplied with a set of drivers, along with the OCR software, on a CD-ROM.
 - (i) State THREE functions of a scanner driver. [3 marks]
 - (ii) Suggest, with explanation, ONE reason why the set of drivers is not supplied on a floppy diskette. [2 marks]
 - (iii) Discuss TWO other methods that could be used for supplying the software. [4 marks]
 - (b) To safeguard their Information Technology systems, all employees of a company have an 8-character password to access the computer network. A password is an example of a logical control access method.
 - (i) Suggest TWO rules that an employee should follow when creating a robust password. [2 marks]
 - (ii) Explain TWO physical control access methods that the company could use to restrict access to the room in which servers and telecommunication cabinets are located. [4 marks]

Total 15 marks

5. Individuals and companies use Information Technology systems daily. The software component is typically built by developers.

- (a) During the development life cycle of an information system, there is the need for agreed deliverables such as test plans that are produced at the design stage. Give THREE other examples of deliverables, and state the stage in the development life cycle at which EACH would be produced. [6 marks]
- (b) The human computer interface (HCI) for an Information Technology system that is to be used by the general public has to be chosen carefully. One example of where menus are used as a HCI is with mobile telephones.
 - (i) State, with explanation, ONE other situation where menus are used as the main feature of the HCI. [3 marks]
 - (ii) A hotel offers bookings via the Internet using an online reservation form. Other than menus, suggest THREE features of a graphical user interface (GUI), giving ONE advantage of EACH feature that would make the booking process simple and user friendly. [6 marks]

Total 15 marks

6. Computer networks are an integral part of life in the 21st century. The Internet is an example of a network.

- (a) Define the term 'protocol' in relation to networking. [2 marks]
- (b) List THREE protocols that are associated with the Internet. [3 marks]
- (c) Explain why protocols are important for communication over the Internet. [3 marks]
- (d) Discuss the differences between a local area network (LAN) and the Internet in terms of the following:
 - (i) Reach
 - (ii) Type of connection
 - (iii) Speed of data transmission [6 marks]
- (e) In a school's computer lab, computers are connected to a wireless local area network (LAN) and the Internet. The wireless LAN is a star network. Students can print their work, store files on a server and access the Web. Draw a **labelled** diagram of the LAN showing at least THREE computers and other features of the LAN. [6 marks]

Total 20 marks

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SECTION III – INFORMATION AND PROBLEM-SOLVING

Answer ALL questions in this section.

7. People are involved in problem-solving activities every day.
- (a) Explain the concept of problem solving in the context of Information Technology. [2 marks]
 - (b) An interview is one of the instruments (tools) that can be used to gather data in the analysis stage of problem solving. Name ONE other instrument that can be used in this stage. [1 mark]
 - (c) Discuss ONE advantage and ONE disadvantage of the instrument named in (b) when compared with interviews. [6 marks]
 - (d) The Board of Governors of a tertiary institution decided to open a second campus in another part of the island. To aid in the decision making on where to locate the campus, the Board will require certain pieces of information. Examine the following pieces of information, and for EACH, state whether it is cosmetic, desirable or essential. **Justify your response.**
 - (i) There are restaurants, bars and a botanical garden nearby.
 - (ii) The buildings will be painted green.
 - (iii) The main bus terminal is one mile from the proposed site. [6 marks]

Total 15 marks

8. Algorithms are blueprints to solving problems and are used by programmers when developing computer programs.

- (a) Identify THREE ways of representing algorithms. [3 marks]
- (b) For any TWO ways identified in (a), discuss the features of EACH way of representing an algorithm. Your response should include an example and an advantage of using the method of representation. [6 marks]
- (c) Consider the algorithm shown in Figure 2 and answer the following questions.

```
Prompt user to enter the value of X
Input X
Y = 1
Z = 1
While Y ≠ X
    Z = Z * Y
    Y = Y + 1
Endwhile
Display X, Y, Z
```



Figure 2

- (i) Assume that the user entered 5 at the prompt, what is the value of X, Y and Z when the algorithm in Figure 2 terminates? [4 marks]
- (ii) Rewrite the algorithm to perform the iteration 10 times without asking the user to enter a value for X. [2 marks]

Total 15 marks

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9. Programming is the development and maintenance of instructions to a computer in a computer language. As the System Development Life Cycle guides Information Technology professionals through Information Technology systems development, the program development cycle guides programmers through the development of computer programs.

- (a) State THREE stages of the program development cycle. [3 marks]
- (b) Explain the term 'control structures'. [2 marks]
- (c) Discuss THREE control structures that a programmer might use to implement tasks that a program is to perform. Your response should clearly highlight the significant differences among the control structures. [9 marks]
- (d) A procedural programming approach to problem solving is most suited in situations that require the use of a single algorithm that is applicable to many different sets of data. For example, calculating the account balances of bank customers, regardless of the amounts deposited or withdrawn by each customer.
 - (i) Describe TWO other situations in which a procedural programming paradigm would be MOST appropriate. [4 marks]
 - (ii) Which programming paradigm is MOST suited to map routes using cities and streets? **Justify your response.** [2 marks]

Total 20 marks

END OF TEST