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FORM TP 2011209



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CARIBBEAN EXAMINATIONS COUNCIL
ADVANCED PROFICIENCY EXAMINATION
INFORMATION TECHNOLOGY

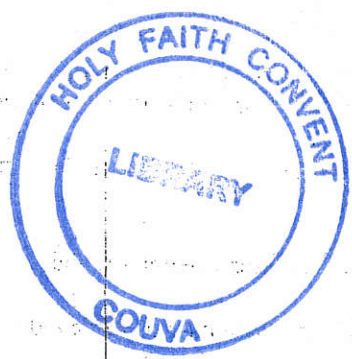
UNIT 1 – PAPER 02

2½ hours

02 MAY 2011 (p.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.

1. Data, information and knowledge are important aspects of a computerized system.
- (a) Using a suitable example, explain EACH of the following terms:
- (i) Data [2 marks]
 - (ii) Information [2 marks]
 - (iii) Knowledge [2 marks]
- (b) (i) Distinguish between 'qualitative data' and 'quantitative data'. [2 marks]
- (ii) Explain which type of data (qualitative or quantitative) MOST appropriately describes data collected from an interview. [1 mark]
- (c) A high school wishes to develop a computerized registration system for its students.
- With respect to this system, discuss ONE example of data and ONE example of information, describing fully how EACH may be appropriately represented in the system. [6 marks]

Total 15 marks

2. Paul has been contracted by the Ministry of Education in his country to conduct research in order to assess the level of Information and Communication Technology usage in the country.
- (a) State THREE sources of information that would be appropriate for Paul's research. [3 marks]
- (b) For EACH information source identified in (a) above
- (i) state the information which may be retrieved [3 marks]
 - (ii) identify a computer-based tool that may be used to assist in its retrieval. [3 marks]
- (c) (i) State THREE characteristics of information sources. [3 marks]
- (ii) Explain EACH of the characteristics stated in (c) (i) above. [3 marks]

Total 15 marks

3. (a) Telecommunications has been utilized greatly in performing many everyday tasks. The Internet is one of the most popular applications used in telecommunications.
- (i) Define the term 'Internet'. [2 marks]
 - (ii) Explain EACH of the following telecommunication terms:
 - a) Transmission medium [2 marks]
 - b) Modulation [2 marks]
 - c) Bandwidth [2 marks]
 - (iii) Discuss the impact of the Internet on EACH of the following:
 - a) Education [2 marks]
 - b) Health [2 marks]
 - c) Human Resource Management [2 marks]
- (b) With the aid of a labelled diagram, explain the concept of automated information processing. [6 marks]

Total 20 marks

SECTION II – INFORMATION TECHNOLOGY SYSTEMS

Answer ALL questions.

4. (a) List **THREE major** components of an information technology system. [3 marks]
- (b) Using an automated teller machine (ATM) system, describe how input, output and storage devices can be used. [6 marks]
- (c) Using a suitable example, explain **EACH** of the following types of application software:
- (i) Management Information Systems [3 marks]
 - (ii) Expert Systems [3 marks]

Total 15 marks

5. The System Development Life Cycle (SDLC) is an important aspect of the development of information systems.
- (a) Use a **labelled diagram** to illustrate the stages of the SDLC. [7 marks]
- (b) Various tools are used at each stage of the SDLC. For **EACH** of the tools specified below, state at which stage it would be most appropriately used, clearly explaining its function at that stage.
- (i) Gantt Chart [2 marks]
 - (ii) Entity-Relationship Diagram [2 marks]
 - (iii) Interview [2 marks]
- (c) Explain why training is an important part of the system development process. [2 marks]

Total 15 marks

6. A network is a collection of computers interconnected by various transmission media. Transmission media may be wired or wireless.
- (a) Explain TWO differences between a Local Area Network (LAN) and a Wide Area Network (WAN). [4 marks]
 - (b) State TWO examples of EACH of the following:
 - (i) Wired transmission media [2 marks]
 - (ii) Wireless transmission media [2 marks]
 - (c) For ONE of the wired and ONE of the wireless transmission media named in (b) above, discuss an application of its use in a school environment. [4 marks]
 - (d) Distinguish between EACH of the following pairs of networking concepts:
 - (i) Intranet and Extranet [4 marks]
 - (ii) MAN and VPN [4 marks]
- Total 20 marks



SECTION III – INFORMATION AND PROBLEM-SOLVING

Answer ALL questions.

7. The problem-solving process is essential in the development of Information Technology (IT) solutions. In a certain organization, the IT manager has decided to use this process to create a solution for automating the tasks performed by the human resource department.
- (a) State FIVE stages of the problem-solving process. [5 marks]
 - (b) Discuss TWO pieces of information that would be relevant to the IT manager. Your discussion should include possible sources of information and the purpose of the information in the problem-solving process. [6 marks]
 - (c) Discuss TWO criteria that the IT manager should consider in deciding if a piece of information can be used and how it should be used. [4 marks]
- Total 15 marks

8. A Dataflow Diagram (DFD) is an important software engineering tool.

(a) Explain the purpose of a DFD in the software engineering process.

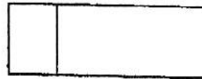
[3 marks]

(b) State the name of EACH of the following DFD symbols:

(i)



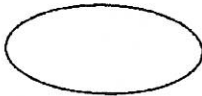
(ii)



(iii)



(iv)



[4 marks]

(c) A payroll system involves the payroll clerk entering the hours worked by weekly paid employees. This results in the calculation of the net pay and the printing of payslips. The payslips are given to the employees and the payroll database is updated.

Draw a context diagram for the payroll system described above.

[8 marks]

Total 15 marks

9. Xavier has been asked to write a program to determine the average score obtained by students in the Information Technology class.
- (a) Identify THREE programming paradigms, stating ONE example of EACH. [6 marks]
 - (b) Explain why it is beneficial for Xavier to write an algorithm BEFORE he begins to write the program. [2 marks]
 - (c) Draw a flow chart for Xavier's program.

Assume:

- (i) The score of each student will be entered one at a time.
 - (ii) The user will indicate by entering '-1' as a score that there are no more scores to be entered. [6 marks]
- (d) When Xavier implemented his solution, the program did not stop requesting grades after the user entered '-1'.
- (i) Explain whether this is a semantic or syntactic error. [3 marks]
 - (ii) Discuss the MOST likely cause of the error and how it could be resolved. [3 marks]

Total 20 marks



END OF TEST