INSTRUCTIONS TO CANDIDATES

1. This paper consists of THREE sections.

2. Answer ONE question from EACH section.
SECTION A

MODULE 1: COMPONENTS OF COMPUTER SYSTEMS

Answer ONE question from this section.

1. (a) Differentiate between EACH of the following as they pertain to computers and information systems:

   (i) ROM and EPROM [2 marks]
   (ii) Bandwidth and speed of a communication channel [2 marks]
   (iii) Compiler and interpreter [2 marks]
   (iv) Mainframe computer and microcomputer [2 marks]
   (v) Modem and hub [2 marks]

(b) State how EACH of the following devices can help protect and preserve the resources of a computer.

   (i) Surge protector [2 marks]
   (ii) Voltage regulator [2 marks]
   (iii) UPS (Uninterruptible Power Supply) [6 marks]

(c) (i) Describe the role of a mail server in a computer network. Is every user required to have his/her own individual mail server or can several users share one mail server? Explain. [4 marks]
   (ii) Briefly discuss the role of a Web server on the Internet or an intranet. [3 marks]
   (iii) Draw a diagram of a client/server network that uses a bus topology, showing the connection of clients and servers in the network. [3 marks]

(d) Explain what is a router. [4 marks]

Total 30 marks
2. (a) Distinguish between ‘intranet’ and ‘extranet’. [4 marks]

(b) Describe ‘TCP’ and ‘IP’ as they relate to the TCP/IP protocol. [4 marks]

(c) (i) Draw a diagram to show the layers of the OSI model for computer communication. [7 marks]

(ii) Describe the functions of the bottom THREE layers of the model drawn in 2(c)(i) above. [6 marks]

(d) Explain with an example how a deadlock may arise in an operating system. [4 marks]

(e) A program called exec1 is being executed by an operating system and before it can be completed, it is interrupted by a small program, exec2, which contains four instructions.

(i) What determines which of exec1 or exec2 will be run? [1 mark]

(ii) Assume exec2 is allowed to run. Explain what is done in the operating system to ensure that exec1 can be properly executed later. [4 marks]

Total 30 marks

SECTION B

MODULE 2: APPLICATIONS OF COMPUTERS

Answer ONE question from this section.

3. (a) Discuss FOUR strategies that can help secure the data in an information system. [12 marks]

(b) Discuss with examples, the following TWO aspects of data security:

(i) Physical [8 marks]

(ii) Logical

(c) Mr Smith works at a company that has licensed a payroll software package called Paydat2007 for exclusive use at the company. One day, he made a copy of the CD (compact disk) with the Paydat2007 program as well as the company’s payroll data files. Next, he installed everything on his home computer. He then accessed some confidential payroll files of the company.

Discuss the legal and ethical implications of Mr Smith’s actions. [10 marks]

Total 30 marks
4. (a) The chief accountant at a company wishes to purchase an accounting software package for his department. He contacts a software sales company, and they send him the details and prices of four popular accounting software packages.

Discuss THREE criteria that the chief accountant should consider before making his final choice of a package. [6 marks]

(b) Discuss THREE main types of user interface available today. [6 marks]

(c) (i) What is an ‘expert’ system? [2 marks]

(ii) Give an example of an expert system. Briefly explain how it works. [2 marks]

(iii) Explain TWO advantages and TWO disadvantages of the expert system given in your response to 4 (c) (ii). [8 marks]

(d) Distinguish between a ‘transaction processing’ system and a ‘decision support’ system. [6 marks]

Total 30 marks
5. (a) State TWO benefits that an individual may derive from gathering information personally (i.e. you are gathering information yourself rather than hiring someone to obtain it). [4 marks]

(b) Describe TWO disadvantages of gathering information by personal contact (e.g. interview between yourself and one other person). [4 marks]

(c) A number of professional organizations use a digital library to make journal and magazine articles available to members who subscribe to the library.

(i) State what is a ‘digital library’. [2 marks]

(ii) Discuss TWO advantages of using a digital library as an information source. [4 marks]

(iii) Discuss TWO disadvantages of a digital library. [4 marks]

(d) A video club currently has a manual system for managing the rental of VHS cassettes and DVDs. The club has 1 000 clients and owns 2 000 VHS tapes and 1 500 DVD movies. Since it is difficult to ascertain how many tapes/DVDs have been rented at a given point in time, it is difficult to estimate if the company is making profits. Also, it is difficult for the owner of the club to perform certain queries. For example, to obtain a list of all outstanding movies, a manual search must be made on all borrowing cards of all the clients. This can take a long time. Management has decided to replace the manual system by an automated system.

In the context of the video club, identify and discuss FOUR major tasks involved in changing over to the automated system. [12 marks]

Total 30 marks
6. In a certain university, lecturers are being encouraged to use computer-based tools to more efficiently and effectively perform the work they do from day to day. The following are some of the work activities typically performed by a lecturer:

- Preparing lectures, notes and assignments which are given as handouts to students
- Preparing slides that are used during lectures to more effectively present learning material to students during class
- Preparing reports on the performance of students who take courses and comparing and analysing performance over several years, based on different factors

(a) Identify ONE software tool that can be used for EACH of the THREE work activities mentioned above. [3 marks]

(b) For EACH software tool identified in 6 (a) above, discuss TWO reasons why that software tool is appropriate for the task required. [18 marks]

(c) A lecturer would like to use a software tool that will enable her to quickly retrieve information on any student she taught previously for the purpose of writing recommendations or to monitor their progress.

(i) Identify ONE software tool which would be suitable for her requirement. [1 mark]

(ii) Briefly describe FOUR features of the software tool you identified in 6 (c) (i) above that would be used to accomplish the given task. [8 marks]

Total 30 marks

END OF TEST