NAMIBIA SENIOR SECONDARY CERTIFICATE

COMPUTER STUDIES HIGHER LEVEL 8324/1

PAPER 1 3 hours

Marks 100 **2013**

Additional Materials: Answer Book

INSTRUCTIONS AND INFORMATION TO CANDIDATES

- Write your answers on the separate answer book provided.
- Write your Centre Number, Candidate Number and Name on all the work you hand in.
- Write in dark blue or black pen.
- You may use a soft pencil for any diagrams or graphs.
- Do not use correction fluid.

- Answer **all** questions.

- At the end of the examination, fasten all your work securely together.
- The number of marks is given in brackets [ ] at the end of each question or part question.

This document consists of **5** printed pages and **3** blank pages.

Republic of Namibia

MINISTRY OF EDUCATION

1 What are the following devices used for in computer networks?

(a) router

(b) modem

(c) switch [3]

2 A programmer has been approached by a supermarket owner to develop a point of sale application to help run the operations at the supermarket.

(a) The programmer decides to use the SDLC (Software Development Life Cycle) approach to develop the application.

Describe **three** tasks that the programmer would perform in the design stage of the SDLC. [3]

(b) The programmer decides to develop the application using a high level programming language.

Give **three** facilities that the programmer can use to facilitate easy maintenance of the application. [3]

(c) After completing the development of the application, the programmer needs to implement it in the supermarket for use.

Identify **two** possible changeover strategies that the programmer could use and explain why each would be suitable to implement the point of sale application at the supermarket. [4]

3 A school in Namibia has a computer laboratory with a computer network composed of 20 computers. The network runs on client/server architecture with a central application and file server therefore, most of the processing is done by the central server. A printer is also connected to a print server that serves all the 20 computers in the Network.

(a) The network has been implemented using a star topology.

(i) Draw a clearly labelled diagram of a star topology. [2]

(ii) Give **one** reason why the school chose a star topology. [2]

(b) All the software is installed on the server.

Explain how all the client computers are able to use an application stored on the server at apparently the same time. [3]

(c) After completing a word processing class in the computer laboratory, the students using all the 20 computers send their documents to the printer for printing.

Explain how spooling is used in this case, to control access of jobs to the printer. [3]

4 A company that makes and sells furniture would like to convert their management records and accounts from a manual system to a computerised system. The company wants to use either a software suite or custom designed software to computerise these operations.

(a) Define the term *software suite.* [1]

(b) Give **two** advantages to the company of using a software suite rather than custom designed software. [2]

(c) Give **two** advantages to the company of using custom designed software rather than a software suite. [2]

(d) You have been asked to advise the above company on their choice of software.

Explain, giving **two** reasons, which software you would advise the company to choose. [2]

5 An information system is a system that provides information according to a user's requests. Describe the following two types of information systems giving an example in each case.

(a) Passive Information system. [2]

(b) Interactive information system. [2]

6 The following algorithm adds the squares of the first five integers and prints the total:

```
Total ← 0
Count ← 1
Repeat
        Sq ← Count * Count
        Total ← Total + Sq
        Count ← Count  + 1
Until Count >5
Print Total
```

(a) **(i)** What is the variable **Total** used for?

(ii) What is the variable **Count** used for?

(iii) What is the variable **Sq** used for? [3]

(b) Rewrite the algorithm making use of a

(i) for .. .. do loop

(ii) while .. .. do loop [6]

(c) Identify which loop structure would be the best to use for solving this problem and give **two** reasons for your choice. [2]

7 **(a)** With the aid of a diagram, show how names may be stored in alphabetical order using a linked list structure by using arrays. Use the names Rachel, Major, Simon, Mary and Jonathan as example data. [3]

(b) Show how the free space can be managed so that items can be easily added to or deleted from the linked list.

(i) Adding the name Henry to the list. [3]

(ii) Deleting the name Major from the list. [3]

8 Programming languages can be categorised into imperative programming languages or declarative programming languages.

(a) Describe what is meant by an *imperative programming language*. [1]

(b) Describe the following types of imperative programming languages:

(i) procedural [2]

(ii) event-driven [2]

(c) **(i)** Describe what is meant by a *declarative programming language.* [1]

(ii) Describe functional programming as used in declarative programming. [2]

9 **(a)** Briefly describe the following terms as used in database management systems.

(i) data dictionary [2]

(ii) index [2]

(b) Describe the difference between a master file and a transaction file. [2]

(c) The above types of files can be organised using either serial file organisation or sequential file organisation.

Describe which type of file organisation is most suitable for each of the above files giving a reason for your answer. [4]

10 The following rules apply to a system for recording student examination marks at a college in Namibia:

- The college has grades 8 to 12, each having one class.
- There are 20 students in each class.
- Each student is identified by his/her grade and an ID number from 1 to 20.
- The pass mark for the examination is 40%. Those who have less than 40% have failed the exam.

The mark each student gets in the exam is stored in a two dimensional array called Student_Mark (grade,student).

(a) Write an algorithm in pseudocode that will,

for each grade:

- Calculate and output the average mark. The mark should be clearly labelled.
- Calculate and output the number of students who have passed. The number of students should be clearly labelled. [11]

(b) (i) What is meant by the term *validation*? [1]

(ii) State and explain a type of validation that can be used while entering the student marks in the array above. [2]

11 (a) Briefly describe top-down design strategy. [3]

(b) Give **three** benefits of using top-down design strategy. [3]

12 A sensor system will only trigger if it receives an output signal (D=1).

This can occur if:

Signal A is negative (A=0) Or

Signal A is positive (i.e. A=1) and signals B and C are both negative

(i.e. B and C are both 0)

(a) Draw a truth table for the above system. [4]

(b) Draw a logic circuit for the above system. [4]

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