

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY
FACULTY OF APPLIED SCIENCE
COMPUTER SCIENCE DEPARTMENT
AUGUST EXAMINATIONS 2009

SUBJECT: PROGRAMMING AND PROGRAM DESIGN
CODE: SCS1201

INSTRUCTION TO CANDIDATES

This question paper consists of **seven (7)** questions; three (3) in section A and four (4) in section B.

Answer all questions in Section A and any two questions from Section B.

Total Marks 100

Time: 3 hours

SECTION A

QUESTION ONE

a) Explain the following:

- | | |
|---------------------------|-----|
| i. Program | [2] |
| ii. Program design | [2] |
| iii. Algorithm | [2] |
| iv. Pseudocode | [2] |
| v. Modularisation | [2] |
| vi. Loop | [2] |
| vii. Programming language | [2] |
| viii. Code | [2] |

b) A file processing system reads a text file consisting of some sentences of text and outputs each word in each sentence of the input file as a separate line of output. A word is defined as any sequence of letters and apostrophes.

Write a pseudocode for the file processing system. [4]

QUESTION TWO

- a) In a sequence of fifty numbers, which are non-zero, determine whether each number is positive or negative. At the end display the total number of positive ones and the total number of negative ones.
- i. Draw a flow chart to the problem. [10]
 - ii. Produce a pseudocode to the problem [5]
- b) What are the characteristics of a good program? [5]

QUESTION THREE

- a) What is the importance of program design? [5]
- b) What are the main requirements of software design methods? [5]
- c) Briefly describe the characteristics of JSP. [5]
- d) What are the advantages of JSP? [5]

SECTION B

QUESTION FOUR

- a) Explain the following statements in C programming:
- i) *While....* Statement [3]
 - ii) *Do....While* Loop [3]
 - iii) *If....*Statement [3]
 - iv) *For....*Statement [3]
- b) JSP structures programs in terms of four components. State and explain these components. [8]

QUESTION FIVE

- a) Explain the design details that should identify the pseudocode. [9]
- b) State and explain the phases in program logic [3]
- c) State and explain the four basic data types used with C programming. [8]

QUESTION SIX

- a) What is a Z-Schema and explain briefly its constituents. [4]
- b) Explain in detail the steps involved in the programming process. [6]
- c) Write a C program that accepts two numbers as input and then computes the sum and display it. [10]

QUESTION SEVEN

- a) Define and explain each of the following programming techniques:
 - i) TOP-DOWN design. [4]
 - ii) BOTTOM-UP design [4]
- b) What is structured programming? [2]
- c) State and explain the properties of algorithms [6]
- d) Write a pseudocode that would prompt for and enter the price of an item being purchased at a retail store and calculate and display the final price including sales tax. Assume the sales tax is 6.5%. [4]

END OF QUESTION PAPER

