



ADVANCED CERTIFICATE IN COMPUTER STUDIES

TOP 5 EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATION

SITTING: NOVEMBER/DECEMBER 2016

SUBJECT: PROGRAMMING II

TIME: 3 HOURS

TOTAL MARKS: 100

PASS MARK: 50

INSTRUCTIONS

1. Write your examination number and national registration card number on the answer booklet.
2. There are seven (7) questions in this paper.
3. Attempt five (5) questions.
4. All questions carry equal marks.
5. Cell phones and programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

Question 1

Differentiate between the following, where appropriate state where they can be applied in computer programming:

- a) Singly linked and doubly linked list. (5 marks)
- b) Queue and stack. (5 marks)
- c) Single and multimedia array (5 marks)
- d) Dynamic and static data structure. (5 marks)

Total marks 20

Question 2

- a) Explain the importance of arrays in programming. (3 marks)
- b) Write a function to define an array of 5 character nodes. (3 marks)
- c) Define the following binary tree terminologies.
 - i) Root node (2 marks)
 - ii) Sibling (2 marks)
 - iii) Leaf node. (2 marks)
- d) Pointers are widely used in programming. Identify the benefits and drawbacks of using pointers. (8 marks)

Total marks 20

Question 3

- a) Explain the term "sorting" in relation to computer programming. (4 marks)
- b) With help of examples describe **four** types of sort algorithms.

(16 marks)

Total marks 20

Question 4

Discuss the differences and similarities between iteration and recursion.

(20 marks)

Question 5

In relation to programming languages that you know, discuss the following:-

- i) Constant and variable. (4 marks)
- ii) Data structure (4 marks)
- iii) Data type (4 marks)
- iv) Array (4 marks)

v) Compiler

(4 marks)

Total marks 20

Question 6

Discuss the development of computer language from the first to the fourth generation.

(20 marks)

Question 7

a) Define searching an item in an array.

(4 marks)

b) For the following array of strings

index	0	1	2	3	4	5	6	7	8	9	10
item	Dan	Mary	Ben	Ken	Silu	Phiri	Sam	Davy	Benj	Kai	Ndola

i) Design an algorithm to search an item **Kai** using binary search algorithm.

(5 marks)

ii) Design an algorithm to search an item **Kai** using linear search algorithm.

(5 marks)

iii) What is a search key and give an example.

(2 marks)

c) Write a program in c++/java to define an array of 25 data items of whole numbers.

(4 marks)

Total marks 20