



KENYATTA UNIVERSITY

UNIVERSITY EXAMINATIONS 2011/2012

SECOND SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE

SBC 345: COMPUTER PROGRAMMING (FORENSIC SCIENCE GROUP)

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DATE: TUESDAY 27TH MARCH 2012

TIME: 2.00 P.M. – 4.00 P.M.

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INSTRUCTIONS

1. Attempt question ONE and any other TWO questions
2. Give examples where possible

QUESTION 1

(a) Define the following terms (2 marks)

- (i) Data Structure
- (ii) Programming language

(b) What is the fundamental structure of an array? (2 Marks)

(c) What is the exact output of any five(5) the program lines below? (5 marks)

```
#include <iostream.h>

main()
{
    int n = 4, k = 2;
    cout << ++n << endl;
    cout << n << endl;
    cout << n++ << endl;
    cout << n << endl;
    cout << -n << endl;
    cout << n << endl;
    cout << --n << endl;
    cout << n << endl;
    cout << n-- << endl;
}
```

(d) Why is main function special in c++?? (2 marks)

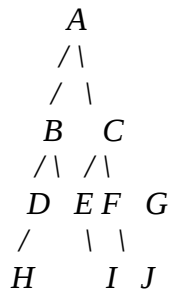
(e) What is run-time error, logical error and syntax error? (3 marks)

- (f) What is compiler and linker? (2 marks)
- (g) You want to write a programme to indicate whether a number entered is odd. Write the pseudocode necessary for the task (4 marks)

QUESTION 2

- (a) You want to write a computer programme that will be able to: get the height of the tallest student and the height of the shortest student. Required:
- Identify at least Four(4) plausible variables (4 marks)
 - Write a pseudocode for the same (6 marks)
- (b) Implement the algorithm using a C++ code (6 marks)
- (c) Show the output of **pre- order**, **in- order** and **post- order** traverse of the binary tree

above: A B C D E F G H I J



- Show the output of :
 - pre-order
 - in_order
 - Post-order traversal of the binary tree below tree (4 Marks)

QUESTION 3

- (a) An employee pay system can be written using structured English as below

If the hours worked is greater than 40

- calculate the regular salary by multiplying the first 40 hours by the rate of pay;
- calculate the overtime pay rate by multiplying the pay rate by 1.5 ('time and a half');
- calculate the overtime salary by multiplying the hours over 40 by the overtime pay rate;

- **add the two salaries together to get the full salary**

Else

- **calculate the full salary by multiplying the hours worked by the rate of pay;**

Write a C++ code for the system. (8 marks)

- b) List and discuss the problem solving phases in computing. (12 marks)

QUESTION 4

- (a) In program development, the programmers need to select the program language to implement the system after design. List and discuss **FOUR** criteria you will use to select a programming language. (8 marks)
- (b) Modular development of systems have been embraced by modern programmers. This approach has been acknowledged to offer better software development to the traditional monolithic approach. List and briefly explain four advantages of modular approach to system development. (8 marks)
- (c) Discuss any FOUR attributes of a good program algorithm (4 marks)

QUESTION 5

- (a) The three basic program control structures include ***Selection; Sequence and Iteration/Looping.***
- (i) Why do you think that these basic building blocks are popular with all programming languages and programmers? Explain giving appropriate examples (6 marks)
- (ii) Use algorithm to represent the three control structures (6 marks)
- (b) Write a C++ code to demonstrate your understanding of:
- (i) Finite loop; (4 marks)
- (ii) Infinite loop (4 marks)