TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR:
BACHELOR OF SCIENCE IN MATHEMATICS & COMPUTER SCIENCE (BSMC)

EIT 4102: FUNDAMENTALS OF PROGRAMMING

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2013
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*

This paper consists of **FIVE** questions. Attempt question **ONE** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **THREE** printed pages

Question One (Compulsory)

a) Define the following **(10 marks)**
   (i) Structured programming
   (ii) Pseudo code
   (iii) Algorithm
   (iv) Flowchart
   (v) Program

b) State TWO advantages of structured programming **(2 marks)**

c) List the various data types used in a C programming language **(4 marks)**

d) Write an algorithm and a flow chart for a program that reads two values, determine the largest value and prints the largest value with an identifying message eg. “X is the largest” **(8 marks)**

e) Explain any SIX features of a good program **(6 marks)**

Question Two

a) Define the term "semantic error" **(2 marks)**

b) Given the following algorithm statements, develop a program flow chart that can be used to represent the same algorithm. Write a C program to implement it.
If value of hours worked > = 30 then
normalpay = hours * rate
Overtime = 0
If hours worked > 30 then
Normalpay = 30 * rate
Overtime pay = chours – 30 *rate*15 **(8 marks)**

c) Explain the type of a linker and a loader in the execution of a software program **(4 marks)**

d) Examine the following algorithm:
1) Let sum = 0
2) Let X = 1
3) While X is less than 199 do Add x to sum
Increment by 2
4) Display the value of sum
5) Stop

Using for construct, write a program to implement the above algorithm **(6 marks)**

Question Three

a) Discuss the importance of the following program control structures:
(i) Selection (Decision)
(ii) Depelition (Looping) **(4 marks)**

b) State SIX factors to be considered when choosing a good programming language **(6 marks)**

c) Develop a program algorithm (using both program flow chart and pseudo code) that allows a user to input the radius and the height of a cylinder and computer the volume of the cylinder. The program should display the computed results. **(6 marks)**

d) A typical programming task can be divided into two phases. Briefly describe the phases. **(4 marks)**

Question Four

a) Differentiate between the following terms as used in computer programming:
(i) Debugging and testing
(ii) Syntax error and logical error
(iii) Source code and object code
(iv) Compiler and interpreter **(12 marks)**

b) Last and explain two advantages of using functions when programming **(2 marks)**

c) Rewrite the code below using
DO-WHILE statement
int n = 1;

```
while (n<=s)
sum = sum +n;
++n;
```

d) Rewrite the above code using for next statement **(3 marks)**

Question Five

a) Discuss program flow control approaches giving examples of the relevant control statement **(6 marks)**

b) Explain the C program Development process **(10 marks)**

c) Differentiate between the following term as used in computer programming:

(i) Pointer and array **(2 marks)**

(ii) Structure and union **(2 marks)**

Define UML **(3 marks)**

d) Consider a software process consisting of the following activities: requirements, gathering object oriented analysis, object oriented design implementation and deployment.

Explain the unit diagram that are essential for each activity. **(8 marks)**

e) Suppose we wish to model an application for registering students in a University academic semester. **(9 marks)**

Identify:

(i) Three classes for the model

(ii) At least three attributes for each class