



MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

SIT 106: PROGRAMMING METHODOLOGY

DATE: 22/7/2019

TIME: 2.00-4.00 PM

INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

QUESTION ONE (30 MARKS, COMPULSORY)

- a) Define the following
 - i. Identifier (2 marks)
 - ii. Variable (2 marks)
- b) What rules are used in creating an identifier? (5 marks)
- c) Give TWO examples for each of the following:
 - i. Data type (2 marks)
 - ii. Editor (2 marks)
 - iii. Compiler (2 marks)
- d) Give TWO reasons why we declare variables in a program (4 marks)
- e) Convert the following expressions into programming statements
 - i) $\sqrt{x^n}$ (2 marks)
 - ii) m^{n-x} (2 marks)
- f) Describe the steps involved in programming (7 marks)

QUESTION TWO (20 MARKS)

- a) Describe the **loop** control structure (8 marks)
- b) Study the program below and answer the questions below

```
#include <iostream>
using namespace std;
int main()
{
    int j;
    for(j=0; j<15; j++)
        cout << j * j << " ";
    cout << endl;
    return 0;
}
```

- i. What is the output of the program (3 marks)
- ii. Rewrite the program using the do..while statement (4 marks)
- iii. Draw a flow chart to represent the program above (5 marks)

QUESTION THREE (20 MARKS)

- a) Describe **Decision Making** Control Structure (8 marks)
- b) Given the following code fragment:
- i. `float p = 1.0; int n = 7; int x=2;`
- ii. `for (int i=1; i<=n; i++) { if (n%2 == 1) p = p * x; cout << p << endl; }`
- c) What is the output of the program? (4 marks)
- d) Express the output in terms of x (3 marks)
- e) Draw a flow diagram to represent these structure (5 marks)

QUESTION FOUR (20 MARKS)

- a) Using an example in each case explain the following terms as used in programming
- i) Call-by-value (5 marks)
- ii) Call-by-reference (5 marks)
- b) Convert the following expressions to a programming statement:
- i) $m^n + e^x$ (5 marks)
- ii) $\sum_{k=0}^n a^{n-k}$ (5 marks)

QUESTION FIVE (20 MARKS)

- a) Using an example explain the difference between a **struct** and a **class** (5 marks)
- b) Write a function that can be used to find the greatest number among THREE floating point numbers (6 marks)
- c) Using examples of your choice explain what you understand by the following
 - i. method overloading (3 marks)
 - ii. accessor method (3 marks)
 - iii. mutator method (3 marks)