MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SUPPLIMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY

SIT 301: FUNDAMENTALS OF PROGRAMMING LANGUAGES

DATE: 22/3/2021 **TIME: 8:30 – 10:30 AM**

INSTRUCTIONS

i) **Answer question ONE and other TWO questions**

ii) **Write on both sides of the answer sheet**

QUESTION ONE (30 MARKS)

a) Explain the use of the following in computer programming:

i) Compiler (2 marks)

ii) Debugger (2 marks)

iii) Assembler (2 marks)

iv) Editor (2 marks)

v) Algorithm (2 marks)

b) What is the significance of a large memory size in a computer (3 marks)

c) Suggest data types to represent the following entities (4 marks)

i) Age of a person.

ii) Income of an employee.

iii) Number of words in a dictionary.

iv) A greeting message.

d) Write a programming statement to represent the following narrative: Compute and print the weekly pay for a worker. All workers are paid an hourly rate and salary is based on hours times rate. Any work done in excess of 40 hours, is paid at 1.5 times the normal rate. (6 marks)

e) Convert the following expressions to a programming statement:

v) $\sqrt{x^2} + y^2$ (2 marks)

vi) $e^x + m^n$ (3 marks)

vii) $(\sqrt{x^2} - 4ac)/2a$ (2 marks)

QUESTION TWO (20 MARKS)

a) Name any two compilers (2 marks)

b) Give two examples of system software and explain their use (4 marks)

c) Consider the following programming statements.

```
int x = 2, n = 6, p = 1;

for (int i = 1; i <= n; ++i)

p = p * x;

System.out.println<< p << endl;
```

i) What is the output value? (4 marks)

ii) Express the output value as a function of x (4 marks)

iii) Draw a flow chart diagram to explain the parts of this loop statement (6 marks)

QUESTION THREE (20 MARKS)

a) What is the output of the following statement. Show clearly how you obtain your answer (3 marks)

```
int main()
{
   int i = 0;
   do
   {
      System.out.println("bamba sana",i++);
   } while (i < 20);
}
```

i) Convert the above statement into a for...statement (3 marks)

ii) Draw a flow-chart to represent the structure shown above (3 marks)

b) Use specific java example code to explain the following terms as used in object oriented programming:

i. Object (3 marks)

ii. Class (3 marks)

c) Use a for statement to print 100 numbers in the following series of data one in each line

5.05 10.10 20.15 40.20 80.25 …… (5 marks)

QUESTION FOUR (20 MARKS)

a) Write a programming statement to represent the following narrative: Compute and print the weekly pay for a worker. All workers are paid an hourly rate and salary is based on hours times rate. Any work done in excess of 40 hours, is paid at 1.5 times the normal rate. (6 marks)

b) Use an example to explain the use of the following keywords in java (6 marks)

i) extends

ii) this

iii) implements

c) Given a quadratic equation, draw a flow diagram to show the algorithm for its solution (8 marks)

QUESTION FIVE (20 MARKS)

a) Use an example to explain the parts of a Java method (5 marks)

b) Name any FIVE programming languages (5 marks)

Write a nested programming statement to print the grades given the conditions as shown below (10 marks)

Marks	Grade
Greater or equal to 70%	"A"
Between 70% and 60%	"B"
Between 60% and 50%	"C"
Less or equal to 50%	"F"