MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SPECIAL/SUPPLIMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO103/SST202 OBJECT ORIENTED PROGRAMMING I

DATE: 26/3/2021 **TIME: 2.00-4.00 PM**

INSTRUCTION: Answer Question ONE and any other TWO Question

QUESTION ONE

a) Outline FOUR features of Java Programming Language (4 marks)

b) write a program to determine the sum of the following harmonic series for a given numbers n (5 marks)

1 + ½ + 1/3 + ¼ + ... + 1/n

c) Describe FOUR types of visibility control in Java (4 marks)

d) Define the following terms as used in object oriented programming. (4 marks)

i. Inheritance

ii. Abstraction

iii. Dynamic binding

iv. Message passing

e) Differentiate between the following set of terms as used in object oriented programming (6 marks)

i. Specialization and generalization

ii. Method overriding and method overloading

iii. Base class and derived class

f) Write a program for computing the area of a rectangle and a circle using polymorphism concept (5 marks)

g) Describe the meaning of an exception as used in Java (2 marks)

QUESTION TWO

a) Describe how Java supports event handling. (5 marks)

b) Using inheritance, write a program that has two classes named *Calculation* and *My_Calculation* respectively. The class *Calculation* should have two methods, *addition* and *Subtraction* that will enable it to find sum and difference of two numbers. The class My_Calculation should have a method *multiplication* that calculates product of two numbers and also inherit the methods of Calculation class. The program should display the results of the three methods when called in the main program. (10 marks)

c) What are the advantages of object-oriented programming over procedural programming? (5 marks)

QUESTION THREE

a) Outline FOUR types of operators used in Java programming giving an example in each case. (4 marks)

b) Write a Java program that outputs grades A, B, C or D depending on Marks entered by a user of a certain subject. Use *switch* statement (5 marks)

c) Write a Java program that prompts the user to enter the amount of rainfall recorded every day of the week and then display the input entered in reverse order. (5 marks)

d) List and explain THREE steps required when creating an object from a class. (6 marks)

QUESTION FOUR

a) State the two aspects of an object that are linked together by encapsulation. (2 marks)

b) Outline rules for method overriding in object oriented programming. (4 marks)

c) Explain TWO limitations of arrays. How does Java address these limitations? (4 marks)

d) Using GUI, write a program that prompts the user for two numbers, the length and width of a rectangle. Use a message box to calculate and display the area of the rectangle. (Use formula: Area=Length x width). (10 marks)

QUESTION FIVE

a) Outline the general syntax of a derived class in Java programming (6 marks).

b) List THREE types of inheritance, hence demonstrate the syntax for each implementation. (10 marks)

c) List FOUR main properties that characterise good abstraction. (4 marks)

d) Give the basic syntax for a class definition (4 marks)