



MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

SECOND YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (ACTUARIAL SCIENCE)

SST202 OBJECT ORIENTED PROGRAMMING I

DATE: 26/11/2020

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) Briefly explain the meaning of the following terms as used in object-oriented programming
 - i. Class
 - ii. Object
 - iii. Abstraction
 - iv. Constructor (4 marks)
- b) Write a Java statement or a set of statements to accomplish each of the following:
 - i. Determine the product of odd integers from 1 to 30 using a *for* loop structure. Assume the variables *num* and *product* have been declared (3 marks)
 - ii. Print the integers from 1 to 100 using a *while* loop and counter variable *x*. Assume the variable *x* has been declared but not initialized. (3 marks)
 - iii. Print the character **A** if a student scores 80 and above, character **B** if the score is between 60 and 79, **C** for score between 50 and 59, and **F** otherwise using **switch statement**. Assume the variable *mark* has been declared (3 marks)
- c) Briefly explain any THREE inbuilt methods used in JAVA (3 marks)
- d) Highlight THREE types of operators used in Java. (3 marks)

- e) State THREE advantages of Java over other object oriented programming languages. (3 marks)
- f) Describe TWO types of exceptions that can be encountered in a Java program. (4 marks)
- g) Java standard Library (or API) includes hundreds of classes and methods grouped into several functional packages. Mention FOUR of the core Java APIs (4 marks)

QUESTION TWO (20 MARKS)

- a) Derrick, a programming student intends to write a program in Java. Highlight any FOUR rules he should follow when declaring identifiers in a program. (4 marks)
- b) Explain the difference between single inheritance and multiple inheritance. (4 marks)
- c) Describe the meaning of the term ‘method overloading’ in the context of object oriented programming. Hence write a Java program to find area of square, rectangle and circle using method overloading. (10 marks)
- d) List TWO pros of using arrays in a program. (2 marks)

QUESTION THREE (20 MARKS)

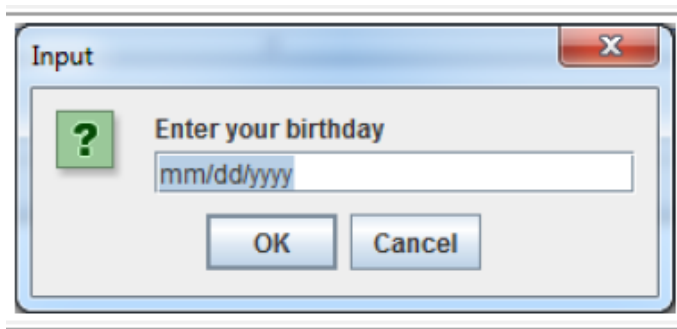
- a) Explain THREE main principles of object-oriented programming. (6 marks)
- b) The smallest individual units in a program are known as *tokens*. Highlight any FOUR tokens applicable in Java programming (4 marks)
- c) Write a java program that prompts the user to enter their first and last name and then returns the length of their first name plus the initials (first characters) of the name. (7 marks)
- d) Write a code snippet to demonstrate polymorphism in object-oriented programming (3 marks)

QUESTION FOUR (20 MARKS)

- a) Java provides a number of access modifiers to set access levels for classes, variables, methods and constructors. Explain the usage of any THREE access modifiers (6 marks)
- b) Java has a rich Graphical User Interface (GUI) facility that allows one to make use of input boxes as well as various dialogs. Outline FOUR of these dialogs. (4 marks)
- c) Write a Java program that stores in an array marks scored by a student in 5 subjects (80, 70, 50, 83, 71). The program should then display all the scores, calculate and display the total score as well as the highest score. (10 marks)

QUESTION FIVE (20 MARKS)

- a) Define 'interface' as used in Java, giving its significance. (2 marks)
- b) In Java, a class can contain any of the following variable types. Explain the meaning of each type. (3 marks)
- i. Local variables
 - ii. Instance variables
 - iii. Class variables
- c) Write a program to display the dialog box shown below. (4 marks)



- d) Create a class for 'Bank Account' abstract data type that has the following features:
- i. It should have the attributes: account number (integer), account holder (string) and current balance (double). (3 marks)
 - ii. Define methods to get and set account numbers and account holders. Add a method which will return the account holder's current balance. (6 marks)
 - iii. Add two methods, which will allow deposit and withdrawal of money updating the current balance as appropriate. (2 marks)