



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS
UNIVERSITY EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN
ACTUARIAL SCIENCE
3RD YEAR 1ST SEMESTER 2022/2023 ACADEMIC YEAR
MAIN CAMPUS

COURSE CODE: ITB 9209

COURSE TITLE: OBJECT ORIENTED PROGRAMMING IN C++

EXAM VENUE : STREAM : Bsc Actuarial Science

DATE EXAM SESSION :

TIME: 2.00 HOURS

INSTRUCTIONS:

- 1. Answer Question 1 (Compulsory) and ANY other two questions**
- 2. Candidates are advised not to write on the question paper**
- 3. Candidates must hand in their answer booklets to the invigilator while in the examination room**

QUESTION ONE [30 MARKS]

a) As a member of the team that is developing the billing system software for Telkom Kenya, you have been assigned the task of creating a software module that accepts and displays customer details. (10 marks)

- i) Mobile number containing maximum of 12 characters.
- ii) Name contains maximum of 25 characters
- iii) Date of Birth containing 10 characters
- iv) Billing address containing 25 characters
- v) City containing maximum of 20 characters
- vi) Residence phone number 10 characters
- vii) Amount containing decimal values.

b) Explain the use of the following principles of Object Oriented Programming (4 Marks)

- i. Class-
- ii. Abstraction-
- iii. Inheritance-
- iv. Encapsulation-

c) Explain an inline function (2 Marks)

d) Explain constructors illustrate with a simple program how a constructor is declared and created. (4

Marks)

f) Write a program that prompts the user to input three numbers. The program should then output the numbers in ascending order. (4 Marks)

G) Explain the following access specifier with respect to C++ Object oriented paradigm. (6 Marks)

- i. Public
- ii. Private
- iii. Public

QUESTION TWO [20 MARKS]

- a) Write a program that a sign data to the data members of a class such as day, month, year and to display the contents of the class on the screen (4 Marks)
- b) Write an object oriented program to find the greatest number among the four variables a, b, c and d whose values are entered at run time. (4 marks)
- c) Explain using appropriate syntaxes state difference between while and do while control structures. (4 marks)
- d) Kenya Commercial Bank has introduction an incentive policy of giving bonus to all its deposits holders. The policy is as follows. A bonus of 2% of the balance held on 31st December is given to every one irrespective of their balances, and 5% is given to female account holder if their balance is more than Kshs 5000/=,Develop a logic structure using if else control structure and block diagram to illustrate the above statement (8 Marks)

QUESTION THREE [20 MARKS]

- a) Write a program in C++that will demonstrate the concept of multilevel inheritance (4 Marks)
- b) Explain any six applications of Object Oriented Programming (6 Marks)
- c) Define an array , the differentiate the initialization process of a one dimensional array with a two dimensional array with C ++ programs (6 Marks)
- d) Explain the following Predefined I/O Class Variables in C++ programming. (4 Marks)
- i. Cin
 - ii. Cout –
 - iii. Cerr-
 - iv. Clog

QUESTION FOUR [20 MARKS]

- a) Explain function overloading using syntaxes (2 Marks)
- b) Explain the following operators in C++. (4 Marks)
- i. Logical operator-
 - ii. Arithmetic
- c) Develop a C++ application that determines whether any of several department-store customers has exceeded the credit limit on a charge account. For each customer, the following facts are available:
- i. Account number
 - ii. Balance at the beginning of the month
 - iii. Total of all items charged by the customer this month
 - iv. Total of all credits applied to the customer's account this month
 - v. Allowed credit limit.

The program should input all these facts as integers, calculate the new balance (= *beginning balance + charges – credits*), display the new balance and determine whether the new balance exceeds the customer's credit limit. For those customers whose credit limit is exceeded, the program should display the message "Credit limit exceeded" (10 Marks)

- d) Write a program to sort a given set of 'N' numbers in descending order using array. (4 marks)

QUESTION FIVE [20 MARKS]

- a) Explain the concept of polymorphic in relation to object oriented paradigm (2 Marks)
- b) Write short notes on friend function (4 Marks)
- c) Write a program in C++ to read the name, age, sex, height and weight of a student and display with proper heading for each variable. (4 Marks)
- d) Using block diagram and syntax explain the following control structures (10 marks)

- i. Nested if control structure

- ii. For loop control structure
- iii. Switch statement
- iv. While statement