

UNIVERSITY EXAMINATIONS

1ST SEMESTER 2022/2023 ACADEMIC YEAR

FIRST YEAR EXAMINATION FOR THE DEGREE
BACHELOR OF SCIENCE (COMPUTER SCIENCE)

COMP 124: PROCEDURAL PROGRAMMING

STREAM: R

TIME: 2 HRS

DAY: TUESDAY [11.30AM – 1.30PM]

DATE: 20/12/2022

THIS QUESTION PAPER CONSISTS OF FIVE (5) PAGES

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INSTRUCTIONS

- Answer **ALL** questions in section A and any **TWO** questions in section B
- All questions in section B carry equal marks

SECTION A (30 MARKS)**QUESTION ONE (30 MARKS)**

- Define Polymorphism. (2 marks)
 - How is it implemented in OOP environment? (4 marks)
- State the purpose of the following in programming: (6 marks)
 - Destructor
 - Inline function
 - Object
- Write syntax code for a class definition. (3 marks)
- What is a function? (2 marks)
 - Write code snippets for 2 ways of defining functions in C++. (4 marks)
- Explain the use of the scope resolution operator (::) and give an example code. (3 marks)
- Write a C++ program that uses a friend function. (6 marks)

SECTION B: - Each question is worth 20 Marks Answer any TWO questions in this section.**QUESTION TWO (20 MARKS)**

- Explain the basic concepts(paradigms) of Object Oriented Programming language. (6 marks)
- Distinguish between function overloading and operator overloading with examples. (6 marks)
- Write a C++ program to print the volume of a cuboid by creating a class named 'volume' having two functions. First function named as 'setDim' takes the length, breadth and height of the rectangle as parameters and the second function named as 'getVolume' returns the volume of the cuboid. Length, breadth and height of the cuboid are entered through the keyboard. (8 marks)



QUESTION THREE (20 MARKS)

- a) Explain call by value and call by reference using appropriate programs. (8 marks)
- b) Write a C++ program that uses either static data members or static member functions. (6 marks)
- c) Discuss any three types of operators. (6 marks)

QUESTION FOUR (20 MARKS)

- a) Write the code of a class named EXAM with following description. (10 marks)

Private Members;

1. ExmCode of type character, 6 characters
2. xnDescription of type character, 40 characters
3. noCandidate of type integer.
4. centersReqd (number of centers required) of type integer.
5. A member function CALCNTR () to calculate and return the number of centers as (noCandidates/100+1).

Public Members;

1. A function SCHEDULE() to allow user to enter values for exmCode, xnDescription, noCandidate and call function CALCNTR() to calculate the number of centers.
2. A function DISPM() to allow user to view the content of all the member data.

(The functions should be prototyped within the class and their definitions placed outside the class)

- (b) write a C++ program that uses a constant. (5 marks)
- (c) Write and explain the FOR loop. (5 marks)

QUESTION FIVE (20 marks)

- (a) Differentiate between a structure and a class and illustrate the appropriate syntax for defining each. (6 marks)
- (b) Define the following terms and describe how each is implemented: -
 - (i) Constructor function
 - (ii) Destructor function
 - (iii) Recursion function

(c) Study the program below and answer the questions that follow: -

```

Class CUSTOMER {
    Int Cust_no; char
    Cust_Name[20]; protected:
        Void Register();

public:
    CUSTOMER();
    void Status();
} obC1;

class SALESMAN {
    private:
        int Salesman_no;
        char
        Salesman_Name[20]; protected:
            float Salary;

public:
    } obS1, obS2;
    SALESMAN();
    void Enter(); void
    Show();

class SHOP : private CUSTOMER , public
    SALESMAN { char Voucher_No[10];
    char Sales_Date[8];
    public:
        SHOP();
        void Sales_Entry();
        void Sales_Detail();
    } obSH1;

```

- (i) State the type of inheritance implemented by the above program. (1 mark)
- (ii) Identify the base-class(es) and the derived class(es) of:
 - Class CUSTOMER (1 mark)
 - Class SHOP (1 mark)
- (iii) State the names of all:
 - Member functions directly accessible by objects of class SALESMAN (1 mark)
 - Functions directly accessible and manipulated by objects of class SHOP. (2 marks)
- (iv) Identify four objects that have been created during the class definitions. (2 marks)

