**Q.1 A)** Write a C++ program to check maximum and minimum of two integer numbers. (Use Inline function and Conditional operator) **[10]**

**B)** Create a base class Account (Acc\_Holder\_Name, Acc\_Holder\_Contact\_No). Derive a two classes as Saving\_Account(S\_Acc\_No., Balance) and Current\_Account( C\_Acc\_No., Balance) from Account. Write a C++ menu driven program to perform following functions:

1. Accept the details for ‘n’ account holders.
2. Display the details of ‘n’ account holders by adding interest amount where interest rate for Saving account is 5% of balance and interest rate for Current account is 1.5% of balance. **[20]**

**Q.2 A)** Write a Python program to accept n numbers in list and remove duplicates from a list. **[10]**

**B)** Write Python GUI program to take accept your birthdate and output your age when a button is pressed. **[20]**

**Q.3** Write an R program to find Sum, Mean and Product of a Vector. **[20]**

OR

Write a blockchain application in JavaScript for the simple transaction.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1** **A)** Write a C++ program to find volume of cylinder, cone and sphere. (Use function overloading). **[10]**

**B)** Create two base classes Learning\_Info (Roll\_No, Stud\_Name, Class, Percentage) and Earning\_Info (No\_of\_hours\_worked, Charges\_per\_hour). Derive a class Earn\_Learn\_info from above two classes. Write necessary member functions to accept and display Student information. Calculate total money earned by the student. (Use constructor in derived class) **[20]**

**Q.2 A)** Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.

*Sample String:* 'The quick Brown Fox'

*Expected Output:*

No. of Upper case characters: 3

No. of Lower case characters: 13. **[10]**

**B)** Write Python GUI program to create a digital clock with Tkinter to display the time. **[20]**

**Q.3** Write an R program to sort a Vector in ascending and descending order.  **[20]**

OR

Write a blockchain application in JavaScript to calculate hash code for the transaction. **[20]**

**Q.4** Viva / Oral  **[10]**

**Q.5** Lab Book  **[10]**

----- X -----

**Q.1** **A)** Write a C++ program to interchange values of two integer numbers. (Use call by reference)

**[10]**

**B)** Create a base class Shape. Derive three different classes Circle, Rectangle and Triangle from Shape class. Write a C++ program to calculate area of Circle, Rectangle and Triangle. (Use pure virtual function). **[20]**

**Q.2 A)** Write a Python program to check if a given key already exists in a dictionary. If key exists replace with another key/value pair. **[10]**

**B)** Write a python script to define a class student having members roll no, name, age, gender. Create a subclass called Test with member marks of 3 subjects. Create three objects of the Test class and display all the details of the student with total marks. **[20]**

**Q.3** Write an R program to find the maximum and the minimum value of a given vector.  **[20]**

OR

Write an ethereum application in JavaScript for smart contracts.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to accept Worker information Worker\_Name, No\_of\_Hours\_worked, Pay\_ Rate and Salary. Write necessary functions to calculate and display the salary of Worker. (Use default value for Pay\_Rate) **[10]**

1. Write a C++ program to create a base classEmployee (Emp-code, name, salary). Derive two classes as Fulltime (daily\_wages, num ber\_of\_days) and Parttime (number\_of\_working\_hours, hourly\_wages). Write a menu driven program to perform following functions:
   1. Accept the details of 'n' employees and calculate the salary.
   2. Display the details of ' n' employees.
   3. Display the details of employee having maximum salary for both types of employees.

**[20]**

**Q.2 A)** Write Python GUI program to create background with changing colors. **[10]**

**B)** Define a class Employee having members id, name, department, salary. Create a subclass called manager with member bonus. Define methods accept and display in both the classes. Create n objects of the manager class and display the details of the manager having the maximum total salary (salary + bonus). **[20]**

**Q.3** Write an R program to extract first 10 English letter in lower case and last 10 letters in upper case and extract letters between 22nd to 24th letters in upper case.  **[20]**

OR

Write a blockchain application in JavaScript for the creation of Transaction block for the account holder. [**20**]

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Consider the following C++ class

class Point

{

int x,y;

public: void setpoint(int, int); // To set the values of x and y co-ordinate

void showpoint(); // To display co-ordinate of a point P in format (x, y).

}; **[10]**

**B)** Create a C++ base class Shape. Derive three different classes Circle, Sphere and Cylinder from shapeclass. Write a C++ program to calculate area of Circle, Sphere and Cylinder. (Use pure virtual function). **[20]**

**Q.2 A)** Write a Python script using class, which has two methods get\_String and print\_String. get\_String accept a string from the user and print String print the string in upper case. **[10]**

**B)** Write a python script to generate Fibonacci terms using generator function. **[20]**

**Q.3** Write an R program to compare two data frames to find the elements in first data frame that is not present in second data frame. **[20]**

OR

Write a blockchain application in JavaScript for the implementation of SHA256 () function.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create two Classes Square and Rectangle. Compare area of both the shapes using friend function.Accept appropriate data members for both the classes.

**[10]**

**B)** Create a C++ class

class Matrix

**{**

int \*\*p;

int r, c;

public:

//member functions

**}**

Write necessary member functions to:

I. Accept Matrix elements

II. Display Matrix elements.

III. Calculate transpose of a Matrix.

(Use constructor and destructor)  **[20]**

**Q.2 A)** Write python script using package to calculate area and volume of cube and sphere **[10]**

**B)** Write a Python GUI program to create a label and change the label font style (font name, bold, size). Specify separate check button for each style. **[20]**

**Q.3** Write an R program to create a data frame using two given vectors and display the duplicated elements and unique rows of the said data frame.  **[20]**

OR

Write a blockchain application in JavaScript to create bitcoin wallet. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1A**) Write a C++ program to create a class which contains single dimensional integer array of given size. Write a member function to display even and odd numbers from a given array. (Use Dynamic Constructor to allocate and Destructor to free memory of an object) **[10]**

**B)** Create a C++ class Person with data members Person\_name, Mobile\_number, Age, City. Write necessary member functions for the following:

* 1. Search the mobile number of given Person.
  2. Search the Person name of given mobile number.
  3. Search all person details of given city.

(Use function overloading) **[20]**

**Q.2 A)** Write Python class to perform addition of two complex numbers using binary + operator overloading. **[10]**

**B)** Write python GUI program to generate a random password with upper and lower case letters. **[20]**

**Q.3** Write an R program to create a simple bar plot of five subject’s marks. **[20]**

OR

Write a JavaScript code for the implementation of block chain technology. (At least two block). **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1** **A)** Write a C++ program to create a class Number, which contain static data member ' cnt' and member function ' Display() '. Display() should print number of times display operation is performed irrespective of the object responsible for calling Display(). **[10]**

**B)** Create a C++ class Vector with data members size & pointer to integer. The size of the vector varies so the memory should be allocated dynamically.

Perform following operations:

I. Accept a vector

II. Display a vector in the format(10,20,30, )

III. Calculate union of two vectors.

(use parameterized constructor & copy constructor) **[20]**

**Q.2 A)** Write a python script to find the repeated items of a tuple. **[10]**

**B)** Write a Python class which has two methods get\_String and print\_String. get\_String accept a string from the user and print\_String print the string in upper case. Further modify the program to reverse a string word by word and print it in lower case. **[20]**

**Q.3** Write an R program to create a Dataframes which contain details of 5 employees and display the details in ascending order. **[20]**

OR

Write a blockchain application in JavaScript to transfer crypto currency from one account to another account. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q. 1** **A)** Create a C++ class MyArray, which contains single dimensional integer array of a give n size. Write a member function to display sum of given array elements. (Use Dynamic Constructor and Destructor) **[10]**

B) Create a base class Student with data members Roll\_No, Name. Derives two classes from it, class Theory with data members M l ,M2, M3, M4 and class Practical with data members Pl, P2. Class Result (Total\_Marks, Percentage, Grade) inherits both Theory and Practical classes. (Use concept of Virtual Base Class and protected access specifiers)

Write a C++ menu driven program to perform the following functions:

1. Accept Student Information
2. Display Student Information
3. Calculate Total\_marks, Percentage and Grade. **[20]**

**Q.2 A)** Write a Python script using class to reverse a string word by word **[10]**

**B)** Write Python GUI program to accept a number n and check whether it is Prime, Perfect or Armstrong number or not. Specify three radio buttons. **[20]**

**Q.3** Write a script in R to create a list of cities and perform the following

1) Give names to the elements in the list.

2) Add an element at the end of the list.

3) Remove the last element. 4) Update the 3rd Element **[20]**

OR

Write a decentralized block chain application in JavaScript for the bank transaction system.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create a class Account with data members Acc\_number, Acc\_type and Balance. Write member functions to accept and display ' n' account details. (Use dynamic memory allocation) **[10]**

**B)** Create a C++ class City with data members City\_code, City\_name, population. Write necessary member functions for the following:

* 1. Accept details of n cities
  2. Display details of n cities in ascending order of population.
  3. Display details of a particular city.

(Use Array of object and to display city information use manipulators.) **[20]**

**Q.2 A)** Write Python GUI program to display an alert message when a button is pressed. **[10]**

**B)** Write a Python class to find validity of a string of parentheses, '(', ')', '{', '}', '[' ']’. These brackets must be close in the correct order.

for example "()" and "()[]{}" are valid but "[)", "({[)]" and "{{{" are invalid. **[20]**

**Q.3** Write an R program to change the first level of a factor with another level of a given factor.**[20]**

OR

Write a blockchain application in JavaScript for the generation of bitcoin after completion of transaction. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create a class Date with data members day, month, and year. Use default and parameterized constructorto initialize date and display date in dd-Mon-yyyy format. (Example: Input: 04-01-2021Output:04-Jan-2021) **[10]**

**B)** Create a C++ class Weight with data members kilogram, gram. Write a C++ program using operator overloading to perform following functions:

1. To accept weight.
2. To display weight in kilogram and gram format.
3. Overload += operator to add two weights. **[20]**

**Q.2 A)** Write a Python program to compute element-wise sum of given tuples.

Original lists: (1, 2, 3, 4) (3, 5, 2, 1) (2, 2, 3, 1)

Element-wise sum of the said tuples: (6, 9, 8, 6) **[10]**

**B)** Write Python GUI program to add menu bar with name of colors as options to change the background color as per selection from menu option. **[20]**

**Q.3** Write an R Program to calculate Multiplication Table **[20]**

OR

Write an ethereum application in JavaScript to transfer currency from one account to another account. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create a class Product with data members Product\_id, Product\_Name, Qty, Price. Write member functions to accept and display Product informational so display number of objects created for Product class. (Use Static data member and Static member function) **[10]**

1. Create a C++ class Cuboid with data members length, breadth, and height. Write necessary member functions for the following:
2. void set values (float,float,float) to set values of data members.
3. void get values( ) to display values of data members.
4. float volume( ) to calculate and return the volume of cuboid.
5. float surface\_ area( )to calculate an d return the surface area of cuboid.

(Use Inline function) **[20]**

**Q.2 A)** Write a Python GUI program to create a label and change the label font style (font name, bold, size) using tkinter module. **[10]**

**B)** Write a python program to count repeated characters in a string.

Sample string: 'thequickbrownfoxjumpsoverthelazydog'

Expected output: o-4, e-3, u-2, h-2, r-2, t-2 **[20]**

**Q.3** Write a script in R to create two vectors of different lengths and give these vectors as input to array and print addition and subtraction of those matrices. **[20]**

OR

Write a blockchain application in JavaScript using bitcoin technology for the implementation of P2P Payment gateway. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to accept radius of a Circle. Calculate and display diameter, circumference as well as area of a Circle. **(Use Inline function) [10]**

1. Create a C++ class MyString with data members a character pointer and str\_length. (Use new and delete operator).Write a C++ program using operator overloadingto perform following operation:
   * 1. ! To reverse the case of each alphabet from a given string.
     2. < To compare length of t\:vo strings.
     3. To add constant 'n' to each alphabet of a string. **[20]**

**Q.2 A)** Write a Python program to input a positive integer. Display correct message for correct and incorrect input. (Use Exception Handling) **[10]**

**B)** Write a program to implement the concept of queue using list. **[20]**

**Q.3** Write an R program to concatenate two given factor in a single factor and display in descending order. **[20]**

OR

Write an ethereum application in JavaScript for the implementation of blockchain technology.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Create a C++ class Sumdata to perform following functions: intsum(int, int) returns the addition of two integer arguments. float sum(flaot, float, float) returns the addition of three float arguments. int sum(int [ ], int) returns the sum of all elements in an array of size ‘n’.

**[10]**

**B)** Write a C++ class Seller (S\_Name, Product\_name, Sales\_Quantity, Target\_Quantity, Month, Commission). Each salesman deals with a separate product and is assigned a target for a month. At the end of the month his monthly sales is compared with target and commission is calculated as follows:

* + If Sales\_Quantity > Target\_Quantity then commission is 25% of extra sales made + 10% of target.
  + If Sales\_Quantity = Target\_Quantity then commission is 10% of target.
  + Otherwise commission is zero.

Display salesman information along with commission obtained. (Use array of objects)

**[20]**

**Q.2 A)** Write a Python GUI program to accept dimensions of a cylinder and display the surface area and volume of cylinder. **[10]**

**B)** Write a Python program to display plain text and cipher text using a Caesar encryption. **[20]**

**Q.3** Consider the inbuilt iris dataset

i) Create a variable “y” and attach to it the output attribute of the “iris” dataset.

ii) Create a bar plot to breakdown your output attribute.

iii) Create a density plot matrix for each attribute by class value.   **[20]**

OR

Write a blockchain application in JavaScript using bitcoin technology for the implementation of double spending. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create a class Machine with data members Machine\_Id, Machine\_Name, Price. Create and initialize all values of Machine object by using parameterized constructor and copy constructor. Display details of Machine using setw() and set precsion().  **[10]**

**B)** Create a C++ class MyMatrix and Write necessary member functions for the following:

1. To accept a Matrix
2. To display a Matrix
3. Overload unary ' -' operator to calculate transpose of a Matrix.
4. Overload unary '++' operator to increment matrix elements by 1. **[20]**

**Q.2 A)** Write a Python class named Student with two attributes student name, marks. Modify the attribute values of the said class and print the original and modified values of the said attributes. **[10]**

**B)** Write a python program to accept string and remove the characters which have odd index values of given string using user defined function. **[20]**

**Q.3** Consider the inbuilt mtcar dataset

i) Subset the vector, “mtcars[,1]“, for values greater than “15.0“.

ii) Subset “airquality” for “Ozone” greater than “28“, or “Temp” greater than “70“. Return the first five rows.

iii) Subset “airquality” for “Ozone” greater than “100“. Select the columns “Ozone“, “Temp“, “Month” and “Day” only. **[20]**

OR

Write an ethereum application in JavaScript for HELLO World contract.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Create a C++ class MyMatrix. Write a C++ program to accept and display a Matrix. Overload binary '-' operator to calculate subtraction of two matrices. **[10]**

**B)** Design two base classes Student(S\_id,Name,Class) and Competition(C\_id,C\_Name). Derive a class Stud\_Comp(Rank) from it. Write a menu driven program to perform following functions:

Accept information.

1. Display information.
2. Display Student Details in the ascending order of Rank of a specified competition.

(Use array of objects) **[20]**

**Q.2 A)** Write a python script to create a class Rectangle with data member’s length, width and methods area, perimeter which can compute the area and perimeter of rectangle. **[10]**

**B)** Write Python GUI program to add items in listbox widget and to print and delete the selected items from listbox on button click. Provide three separate buttons to add, print and delete. **[20]**

**Q.3** Write an R program to extract the five of the levels of factor created from a random sample from the LETTERS **[20]**

OR

Write a block chain application in JavaScript to create a block by using hyper ledger fabric.

**[20]**

**Q.4** Viva/Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Create a C++ class Student with data members Roll\_no, S\_Name, Class, Percentage. Accept two students information and display information of student having maximum percentage. (Use this pointer) **[10]**

**B)** Create a C++ class MyArray with data members

* + int\* arr
  + int size

Write necessary member functions to accept and display Array elements. Overload the following operators:

**Operator Example Purpose**

-(Unary) -A1 Reverse array elements

+(Binary) A1+n Add constant to all array elements **[20]**

**Q.2 A)** Write Python GUI program that takes input string and change letter to upper case when a button is pressed. **[10]**

**B)** Define a class Date (Day, Month, Year) with functions to accept and display it. Accept date from user. Throw user defined exception “invalid Date Exception” if the date is invalid.

**[20]**

**Q.3** Write an R Program to calculate Decimal into binary of a given number. **[20]**

OR

Write a blockchain application in JavaScript to calculate hash code for the transaction. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to create a class Distance with data members meter and centimeter to represent distance. Write a function Larger( )to return the larger of two distances. (Use this pointer)  **[10]**

**B)** Create a C++ base class Media. Derive two different classes from it, class NewsPaper with data members N\_Name, N\_Editor, N\_Price, No\_of\_Pages and class Magazine with data members M\_Name,M\_Editor, M\_Price. Write a C++ program to accept and display information of both NewsPaper and Magazine. (Use pure virtual function) **[20]**

**Q.2 A)** Create a list a = [1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89] and write a python program that prints out all the elements of the list that are less than 5 **[10]**

**B)** Write a python script to define the class person having members name, address. Create a subclass called Employee with members staffed salary. Create 'n' objects of the Employee class and display all the details of the employee. **[20]**

**Q.3** Write an R program to draw an empty plot and an empty plot specify the axes limits of the graphic. **[20]**

OR

Write a blockchain application in JavaScript for the creation of Transaction block for the account holder. **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Create a C++ class Number with integer data mem ber. Write necessary member functions to overload the operator unary pre and post increment ' ++'. **[10]**

**B)** Create a class College containing data members as College\_Id, College\_Name, Establishment\_year, University\_Name. Write a C++ program with following member functions:

1. To accept ‘n’ College details
2. To display College details of a specified University
3. To display College details according to a specified establishment year

(Use Array of Object and Function overloading) **[20]**

**Q.2** **A)** Write a Python GUI program to accept a number form user and display its multiplication table on button click. **[10]**

**B)** Define a class named Shape and its subclass(Square/ Circle). The subclass has an init function which takes an argument (Length / radius). Both classes should have methods to calculate area and volume of a given shape. **[20]**

**Q.3** Write an R program to create three vectors a,b,c with 3 integers. Combine the three vectors to become a 3×3 matrix where each column represents a vector. Print the content of the matrix.

**[20]**

OR

Write a blockchain application in JavaScript to transfer cryptocurrency from one account to another account.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Create a C++ class Employee with data members Emp\_id, Emp\_Name, Company\_Nameand Salary. Write member functions to accept and display Employee information. Design User defined Manipulator to print Salary.

(For Salary set right justification, maximum width to 7 and fill remaining spaces with '\*') **[10]**

**B)** Create a C++ class for a two dimensional points. Write necessary member functions to accept &display the point object. Overload the following operators:

|  |  |  |
| --- | --- | --- |
| **Operator** | **Example** | **Purpose** |
| + (Binary) | P3=P l+P2 | Adds coordinates of point pl and p2. |
| - (Unary) | -Pl | Negates coordinates of point pl. |
| \*(Binary) | P2=P l\*n | Multiply coordinates of point pl by constant 'n'. |

**[20]**

**Q.2 A)** Write a python program to create a class Circle and Compute the Area and the circumferences of the circle. (use parameterized constructor) **[10]**

**B)** Write a Python script to generate and print a dictionary which contains a number (between 1 and n) in the form(x,x\*x).

Sample Dictionary (n=5) Expected Output: {1:1, 2:4, 3:9, 4:16, 5:25} **[20]**

**Q.3** Consider the plantGrowth inbuilt dataset

i) Create a variable “y” and attach to it the output attribute of the “plantGrowth” dataset.

ii) Create a barplot to breakdown your output attribute.

iii) Create a density plot matrix for each attribute by class value. **[20]**

OR

Write a JavaScript code for the implementation of block chain technology. (At least two block). **[20]**

**Q.4** Viva/Oral  **[10]**

**Q.5** Lab Book  **[10]**

----- X -----

**Q.1 A)** Create a C++ class MyString with data member character pointer. Write a C++ program to accept and display a string. Overload '+' operator to concatenate two strings. **[10]**

**B)** Create a C++ class Complex Number with data members real and imaginary. Write necessary functions:

1. To accept Complex Number using constructor.
2. To display Complex Number in format [x +iy].
3. To add two Complex Numbers by using friend function **[20]**

**Q.2 A)** Define a class named Rectangle which can be constructed by a length and width. The Rectangle class has a method which can compute the area and Perimeter. **[10]**

**B)** Write a Python program to convert a tuple of string values to a tuple of integer values.

Original tuple values: (('333', '33'), ('1416', '55')) New tuple values: ((333, 33), (1416, 55))

**[20]**

**Q.3** Consider Weather dataset

i) Selecting using the column number

ii) Selecting using the column name

iii) Make a scatter plot to compare Wind speed and temperature **[20]**

OR

Write a decentralized block chain application in JavaScript for the bank transaction system.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1** **A)** Create a C++ class FixDeposit with data members FD\_No, Cust\_Name, FD\_Amt, Interestrate, Maturity amt, Number\_of\_months. Create and Initialize all values of FixDeposit object by using parameterized constructor with default value for interest rate. Calculate maturity amt using interest rate and display all the details. **[10]**

**B)** Define a class Product that contains data member as Prod\_no, Prod\_Name, Prod\_Price. Derive a class Discount (discount\_in\_Percentage) from class Product. A Customer buys ‘n’ products. Accept quantity for each product , calculate Total Discount and accordingly generate Bill. Display the bill using appropriate Manipulators. **[20]**

**Q.2 A)** Write a python class to accept a string and number n from user and display n repetition of strings by overloading \* operator. **[10]**

**B)** Write a python script to implement bubble sort using list **[20]**

**Q.3** Write an R program to print the numbers from 1 to 100 and print "SY" for multiples of 3, print "BBA" for multiples of 5, and print "SYBBA" for multiples of both.  **[20]**

OR

Write an ethereum application in JavaScript for the implementation of blockchain technology.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to calculate mean, mode and median of three integer numbers. (Use Inline function) **[10]**

**B)** Create a C++ class for inventory of Mobiles with data members Model, Mobile\_Company, Color, Price and Quantity. Mobile can be sold, if stock is available, otherwise purchase will be made. Write necessary member functions for the following:

1. To accept mobile details from user.
2. To sale a mobile. (Sale contains Mobile details &number of mobiles to be sold.)
3. To Purchase a Mobile. (Purchase contains Mobile details & number of mobiles to be purchased) **[20]**

**Q.2 A)** Write a Python GUI program to create a label and change the label font style (font name, bold, size) using tkinter module. **[10]**

**B)** Create a class circles having members radius. Use operator overloading to add the radius of two circle objects. Also display the area of circle. **[20]**

**Q.3** Write a script in R to create two vectors of different lengths and give these vectors as input to array and print second row of second matrix of the array. **[20]**

OR

Write a blockchain application in JavaScript to create a block by using hyperledger fabric.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to find average of 3 integer numhers and average of 3 float numhers. (Use function overloading) **[10]**

**B)** Create a C++ class Time with data members hours, minutes, seconds. Write a C++ program using operator overloading to perform the following:

1. != To check whether two Times are equal or not.
2. >> To accept the time.
3. << To display the time. **[20]**

**Q.2 A)** Write a Python Program to Check if given number is prime or not. Also find factorial of the given no using user defined function. **[10]**

**B)** Write Python GUI program which accepts a number n to displays each digit of number in words. **[20]**

**Q.3** Write a script in R to create two vectors of different lengths and give these vectors as input to array and print Multiplication of those matrices. **[20]**

OR

Write an ethereum application in JavaScript for smart contracts.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to read two float numbers. Perform arithmetic binary operations like +, - , \*, / on these numbers using Inline Function. Display resultant value with a precision of two digits. **[10]**

**B)** Create a base class Travels with data members T\_no, Company\_Name. Derive a class Route with data members Route\_id, Source, and Destination from Travels class. Also derive a class Reservation with data members Number\_of\_Seats, Travels\_Class, Fare, and Travel\_Date from Route.

Write a C++ program to perform following necessary member functions:

* 1. Accept details of •n' reservations.
  2. Display details of all reservations.
  3. Display reservation details of a specified Date. **[20]**

**Q.2 A)** Write a Python function that accepts a string and calculate the number of upper case letters and lower case letters.

*Sample String* : 'The quick Brow Fox'

*Expected Output* :

No. of Upper case characters : 3

No. of Lower case Characters : 12 **[10]**

**B)** Write a Python script to Create a Class which Performs Basic Calculator Operations. **[20]**

**Q.3** Write an R program to create a list of elements using vectors, matrices and a functions. Print the content of the list. **[20]**

OR

Write an ethereum application in JavaScript to transfer currency from one account to another account.  **[20]**

**Q.4** Viva / Oral  **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write a C++ program to read array of 'n' integers from user and display it in reverse order. (Use Dynamic memory allocation) **[10]**

**B)** Create a C++ class Employee with data members Emp\_Id, Emp\_Name, Mobile\_No, Salary. Write necessary member functions for the following:

1. Accept details of n employees
2. Display employee details in descending order of their salary.
3. Display details of a particular employee.

(Use Array of object and Use appropriate manipulators) **[20]**

**Q.2 A)** Write an anonymous function to find area of square and rectangle. **[10]**

**B)** Write Python GUI program which accepts a sentence from the user and alters it when a button is pressed. Every space should be replaced by \*, case of all alphabets should be reversed, digits are replaced by ? **[20]**

**Q.3** Write a script in R to create an array, passing in a vector of values and a vector of dimensions. Also provide names for each dimension. **[20]**

OR

Write an ethereum application in JavaScript for HELLO World contract. **[20]**

**Q.4** Viva / Oral  **[10]**

**Q.5** Lab Book  **[10]**

----- X -----

**Q.1 A)** Write a C++ program to accept length and width of a rectangle. Calculate and display perimeter as well as area of a rectangle by using Inline function. **[10]**

**B)** Create a C++ class VisitingStaff with data members Name, No\_of\_Subjects, Name\_of\_Subjects[], Working\_hours, Total\_Salary. (Number of subjects varies for a Staff). Write a parameterized constructor to initialize the data members and create an array for Name\_of\_Subjects dynamically. Display VisitingStaff details by calculating salary. (Assume remuneration Rs.300 per working hour) **[20]**

**Q.2 A)** Write a Python program to unzip a list of tuples into individual lists. **[10]**

**B)** Write Python GUI program to accept a decimal number and convert and display it to binary, octal and hexadecimal number. **[20]**

**Q.3** Write an R Program to calculate binary into Decimal of a given number.  **[20]**

OR

Write a blockchain application in JavaScript for the implementation of SHA256 () function.

**[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

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**Q.1 A)** Write C++ program to create two classes Integer\_Array and Float\_Array with an array as a data member. Write necessary member functions to accept and display array elements of both the classes. Find and display average of both the array. (Use Friend function) **[10]**

**B)** Create a C++ class Marksheet with data members Seat\_No, Student\_Name, Class, Subject\_Name[],Int\_Marks[], Ext\_Marks[], Total[], Grand\_Total, Percentage, Grade. Write member function to accept Student information for 5 subjects. Calculate Total, Grand\_Total, Percentage, Grade and use setw(), setprecision() and setfill () to display Marksheet. **[20]**

**Q.2 A)** Write a Python GUI program to create a list of Computer Science Courses using Tkinter module (use Listbox) **[10]**

**B)** Write a Python program to accept two lists and merge the two lists into list of tuple. **[20]**

**Q.3** Write an R program to convert a given matrix to a list and print list in ascending order. **[20]**

OR

Write a blockchain application in JavaScript for the simple transaction.  **[20]**

**Q.4** Viva / Oral **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A**) Write the definition for a class called ‘point’ that has x & y as integer data members. Use copy constructor to copy one object to another. (Use Default and parameterized constructor to initialize the appropriate objects) Write a C++ program to illustrate the use of above class. **[10]**

**B)** Create a class Clock that contains integer data members as hours, minutes and seconds. Write a C++ program to perform following member functions: void setclock(int, int, int ) to set the initial time of clock object. Void showclock() to display the time in hh:min:sec format. Write a function tick( ) which by default increment the value of second by 1 or according to user specified second. The clock uses 24 hours format. **[20]**

**Q.2 A)** Write a Python GUI program to calculate volume of Sphere by accepting radius as input.

**[10]**

**B)** Write a Python script to sort (ascending and descending) a dictionary by key and value. **[20]**

**Q.3** Write a script in R to create a list of students and perform the following

1) Give names to the students in the list.

2) Add a student at the end of the list.

3) Remove the first Student.

4) Update the second last student. **[20]**

OR

Write a blockchain application in JavaScript using bitcoin technology for the implementation of P2P Payment gateway. **[20]**

**Q.4** Viva / Oral  **[10]**

**Q.5** Lab Book **[10]**

----- X -----

**Q.1 A)** Write C++ program to create two classes Integer\_Array and Float\_Array with an array as a data member. Write necessary member functions to accept and display array elements of both the classes. Find and display average of both the array. **(Use Friend function) [10]**

1. Create a C++ class Marksheet with data members Seat\_No, Student\_Name, Class, Subject\_Name[], Int\_Marks[], Ext\_Marks[], Total[], Grand\_Total, Percentage, Grade. Write member function to accept Student information for 5 subjects. Calculate Total, Grand\_Total, Percentage, Grade and use **setwO, setprecisionO and setfillQ to** display Marksheet. **[20]**

**Q.2 A)** Write a Python GUI program to accept a string and a character from user and count the occurrences of a character in a string. **[10]**

**B)** Python Program to Create a Class in which One Method Accepts a String from the User and Another method Prints it. Define a class named Country which has a method called print Nationality. Define subclass named state from Country which has a mehtod called printState. Write a method to print state, country and nationality. **[20]**

**Q.3** Write an R program to sort a list of 10 strings in ascending and descending order. **[20]**

OR

Write a blockchain application in JavaScript using bitcoin technology for the implementation of double spending. **[20]**

**Q.4** Viva / Oral  **[10]**

**Q.5** Lab Book **[10]**

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