```
        Derived(){}
        Derived(){}
        private:
        protected:
  };
 int main()
 {
   cout << "Executed" << endl;
 }
```

(a) Executed (b) Error (c) Exception (d) None of these

viii. Which is the correct statement about operator overloading in C++? **1**

(a) Only arithmetic operators can be overloaded
(b) Associativity and precedence of operators does not change
(c) Precedence of operators are changed after overloading
(d) Only non-arithmetic operators can be overloaded

ix. By default mode of, all the files in C++ are opened in _____ mode. **1**

(a) Text (b) Binary
(c) ASCII (d) VTC

x. The _____ diagram is time oriented? **1**

(a) Collaboration (b) Sequence
(c) Activity (d) None of these

Q.2 i. What is function? Write syntax of function declaration. **2**

ii. How pointer can store the address of an array? Justify your answer with program. **3**

iii. Write a program to reverse any string without using string library function. **5**

OR iv. What is entry control loop? Write a program to print factorial of a number. **5**

Q.3 i. Explain the use of new keyword. **2**

ii. Write difference between C and C++. **3**

iii. What is object oriented programming? Explain characteristics of object oriented programming. **5**

OR iv. How abstraction is implemented in object oriented programming? Explain with example. **5**

Enrollment No.....

Faculty of Engineering

End Sem (Odd) Examination Dec-2022

CB3CO04 Object Oriented Programming

Programme: B.Tech. Branch/Specialisation: CSBS

Duration: 3 Hrs. **Maximum Marks: 60**

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

Q.1 i. What will be output of the following c program? **1**

```
#include <stdio.h>
int main()
{
 int i,j;
 int mat[3][3]={9,8,7,6,5,4,3,2,1};
 for(i=2;i>=0;i--)
   for(j=0;j<=2;j++)
      printf("%d",*(*(mat+j)+i));
}
```

(a) 741852963 (b) 123456789
(c) 987654321 (d) 478125693

ii. What will be output of the following c program? **1**

```
#include <stdio.h>
int main()
{
 int i=5,j=5;
while(i+1?--i:j++)
printf("%d",i);
return 0;
}
```

(a) 1234 (b) 1243 (c) 4321 (d) 2134

iii. What will be output of the following c program? **1**

```
#include <stdio.h>
int y=100;
int fun(int y)
{
```

```
    y = 130;
    return y;
}
int main()
{
  int y = 120;
  y=fun(y);
  printf("%d", y);
  return 0;
}
```

(a) 100 (b) 120 (c) 130 (d) Garbage value

iv. An expression A.B in C++ means _____. **1**

(a) A is member of object B (b) B is member of Object A

(c) Product of A and B (d) None of these

v. What will be the output of the following C++ code? **1**

```
#include <iostream>
#include <string>
using namespace std;
class A{
 int a;
 public:
 A(){
  a = 25;
 }
 void assign(int i){
  a = i;
 }
 int return_value(){
  return a;
 }
};
int main(int argc, char const *argv[])
{
 A obj;
 obj.assign(15);
 cout<<obj.return_value();
}
```

(a) 25 (b) 15 (c) 0 (d) Unpredicted value

vi. Predict the output of the following C++ code? **1**

```
#include <iostream>
using namespace std;
class A
{
 static int a;
    public:
 void show()
       {
  a++;
  cout<<"a: "<<a<<endl;
 }
};
int A::a = 5;
int main()
{
 A a;
 return 0;
}
```

(a) Error as a private member a is referenced outside the class

(b) Segmentation fault

(c) No output

(d) Program compiles successfully but gives run-time error

vii. What is the output of this program? **1**

```
#include<iostream>
 using namespace std;
  class Base
    {
       public:
          Base(){}
          ~Base(){}
          protected:
          private:
    };
    class Derived:public Base
    {
       public:
```

Q.4	i.	Which keyword is used to call current instance of object and how?	**2**
	ii.	Can private member is access outside the class explain with example?	**3**
	iii.	How and when constructor is call? Write a program for constructor overloading?	**5**
OR	iv.	Write a program to implement a class book having data member: tit1e, authorname, price and publishername. And two member function getdata() and showdata() to show details of book. Create an objects of book class to store record of 20 books? (Assume necessary data members and member functions)	**5**
Q.5	i.	Name the operators which are not overloaded in C++?	**2**
	ii.	Inheritance provides code reusability? Justify your answer.	**3**
	iii.	What do you mean by diamond problem? How this problem is solved in C++?	**5**
OR	iv.	We want to calculate the total marks of each student of a class in Physics, Chemistry and Mathematics and the average marks of the class. The number of students in the class is entered by the user. Create a class named Marks with data members for roll number, name and marks. Create three other classes inheriting the Marks class, namely Physics, Chemistry and Mathematics, which are used to define marks in individual subject of each student. Roll number of each student will be generated automatically.	**5**
Q.6	i.	Write use of UML.	**2**
	ii.	What do you mean by generic programming?	**3**
	iii.	Write a program to copy content of one file to another file.	**5**
OR	iv.	Draw a class diagram for given problem statement: Create a class named Shape with a function that prints "This is a shape". Create another class named Polygon inheriting the Shape class with the same function that prints "Polygon is a shape". Create two other classes named Rectangle and Triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively. Again, make another class named Square having the same function which prints "Square is a rectangle".	**5**

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[5]

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Marking Scheme
CB3CO04 Object Oriented Programming

Q.1	i.	**Ans: a 741852963**	**1**
	ii.	**Ans: c. 4321**	**1**
	iii.	**Ans: c. 130**	**1**
	iv.	**Ans: b. B is member of Object A**	**1**
	v.	**Ans: b. 15**	**1**
	vi.	**Ans: c. No output**	**1**
	vii.	**Ans: b. Error**	**1**
	viii.	**Ans: b. Associativity and precedence of operators does not change**	**1**
	ix.	**Ans: a. Text**	**1**
	x.	**Ans: b. Sequence**	**1**
Q.2	i.	What is function? Write syntax of function declaration? **Function Definition 1 mark** **Syntax 1 mark**	**2**
	ii.	How pointer can store the address of an array? Justify your answer with program? **Syntax for address 1 mark** **Program 2 marks**	**3**
	iii.	Write a program to reverse any string without using string library function? **String input 2 marks** **Loop and correct program 3 marks**	**5**
OR	iv.	What is entry control loop? Write a program to print factorial of a number? **Entry control loop (for/while) 2 marks** **Correct program 3 marks**	**5**
Q.3	i.	Explain the use of new keyword? **New Definition 2 marks**	**2**
	ii.	Write difference between C and C++? **1 mark for each difference**	**3**
	iii.	What is object oriented programming? Explain characteristics of object oriented programming. **OOP Definition 2 marks**	**5**
		Characteristics of OOPs 3 marks (.5 for each)	
OR	iv.	How abstraction is implemented in object oriented programming, explain with example? **Abstraction Definition 1 mark** **Program 4 mark**	**5**
Q.4	i.	Which keyword is used to call current instance of object and how? **This keyword Definition 1 mark** **Syntax 1 mark**	**2**
	ii.	Can private member is access outside the class explain with example? **Friend function 1 mark** **Syntax 2 marks**	**3**
	iii.	How and when constructor is call? Write a program for constructor overloading? **Constructor calling/declaration 1 mark** **Program 4 marks**	**5**
OR	iv.	Write a program to implement a class book having data member: tit1e, authorname, price and publishername. And two member function getdata() and showdata() to show details of book. Create an objects of book class to store record of 20 books? (Assume necessary data members and member functions) **Class Definition with members 3 marks** **Object creation and member calling 2 marks**	**5**
Q.5	i.	Name the operators which are not overloaded in C++? **::, sizeof, .*, ?: .5 mark for each**	**2**
	ii.	Inheritance provides code reusability? Justify your answer **Reason 1 mark** **Syntax/Program 2 marks**	**3**
	iii.	What do you mean by diamond problem? How this problem is solved in C++? **Diamond problem/Ambiguity 2.5 marks** **Virtual function 2.5 marks**	**5**
OR	iv.	We want to calculate the total marks of each student of a class in Physics, Chemistry and Mathematics and the average marks of the class. The number of students in the class is entered by the user. Create a class named Marks with data members for roll number, name and marks. Create three other classes inheriting the Marks class, namely Physics, Chemistry and Mathematics, which are used	**5**

		to define marks in individual subject of each student. Roll number of each student will be generated automatically. **Class Definition with members 2 marks** **Inheritance and calculation 2 marks** **Object creation and member calling 1 mark**	
Q.6	i.	Write use of UML? **UML Definition 2 marks**	**2**
	ii.	What do you mean by generic programming? **Definition with example 3 marks**	**3**
	iii.	Write a program to copy content of one file to another file? **Object creation and open the file 1 mark** **Reading and writing with file 4 marks**	**5**
OR	iv.	Draw a class diagram for given problem statement: Create a class named Shape with a function that prints "This is a shape". Create another class named Polygon inheriting the Shape class with the same function that prints "Polygon is a shape". Create two other classes named Rectangle and Triangle having the same function which prints "Rectangle is a polygon" and "Triangle is a polygon" respectively. Again, make another class named Square having the same function which prints "Square is a rectangle". **Class diagram with correct relation 5 marks**	**5**

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