

CS IT 2015

(Set-1)

**B.Tech-4th****Object Oriented Programming**

Full Marks : 70

Time : 3 hours

Answer Q.No.1 which is compulsory and any five from the rest

The figures in the right-hand margin indicate marks

I. Answer the following questions : 2 × 10

(a) Differentiate between declaration and definition in C++

(b) Find the output of the following program

```
class complex {
    double re ;
    double im ;
public :
    complex ( ) : re (1), im (0.5) { }
    bool operator == (complex & rhs);
    operator int ( ) {}
};
```

```
bool complex :: operator ==
    (complex & rhs){
    if ((this->re == rhs.re) &&
        (this->im == rhs.im))
        return true ;
    else
        return false ;
}
```

```
int main ( ){
    complex c1 ;
    cout << c1;
}
```

(c) Find the output of the following program

```
void main ( )
{
    int a, *pa, &ra ;
    pa = &a ;
    ra = a ;
    cout << " a = " ;
}
```

(d) Find the output of the following program

```

class base
{
public:
virtual void baseFun ( )
    {cout << "from base" ;}
class deri : public base
{
public:
void baseFun ( ) { cout <<
    "from derived" };
void SomeFunc (base * base Obj)
{
    baseObj->baseFun ( );
}
int main ( )
{
base baseObject ;
SomeFunc (& baseObject) ;
deri deriObject ;
SomeFunc (& deriObject);
}

```

(e) Find the output of the following program

```

#include < iostream >
using namespace std ;
int x = 10 ;
void fun ( )
{
    int x = 2 ;
    {
        int x = 1 ;
        cout << :: x << endl ;
    }
}
int main ( )
{
    fun ( ) ;
    return 0 ;
}

```

(f) Find the output of the following program.

```

#include < iostream >
using namespace std ;
class Point {

```

```

private :
    int x ;
    int y ;
public :
    Point (int i, int j); // Constructor
};
Point :: Point (int i = 0, int j = 0) {
    x = i ;
    y = j ;
    cout << "Constructor called" ;
}
int main ( )
{
    Point t1, *t2 ;
    return 0;
}

```

- (g) What is the output when the following code fragment is executed ?

```

int found = 0, count = 5 ;
if (! found || --count == 0)
    cout << "danger" << endl ;
cout << "count = " << count << endl ;

```

- (h) What do you mean by dynamic initialization of objects ?

- (i) Suppose that the following code fragment is executed.

```

const int LENGTH = 21 ;
char message [LENGTH],
cout << "Enter a sentence on the line
                                below." << endl ;
cin >> message ;
cout << message << endl ;

```

Suppose that in response to the prompt, the interactive user types the following line and presses Enter .

Please go away.

What will the output of the code fragment look like ?

- (j) What is the output when the following code fragment is executed ?

```

int found = 0, count = 5 ;
if (! found , --count == 0)
    cout << "danger" << endl ;
cout << "count = " << count << endl ;

```

2. (a) Write a C++ program to calculate the absolute value of any given number. Define user defined function Abs ( ) Make it inline 5

- (b) Write a C++ program to calculate the sum of alternate digits of an entered number having  $n$  digits. 5
3. (a) Describe various types of inheritance with suitable example. 5
- (b) Create a class Float that contains one float data member. Overload all the four arithmetic operators so that they operate on the objects of FLOAT. 5
4. (a) How polymorphism is achieved at compile time and run time? Give an example of a program that uses polymorphism. 5
- (b) Write a program to allocate memory to store 3 integers. Use new and delete operators for allocating and deallocating memory. Initialize and display the values. 5
5. (a) Write a program to accept 10 integers in an array. Check all numbers in the array. When any negative number is found, throw an exception. 5

- (b) Write a program to exchange values of two variables. Use template variables as function arguments. 5
6. Write notes on any two of following : 5 + 5
- (i) Templates
- (ii) Data Encapsulation
- (iii) Virtual destructor.
7. (a) Explain about how to measure the quality of an abstraction. 5
- (b) State and explain the problem of classification and the various approaches to classification. 5
8. (a) Write a C++ program to overload the operator to add two complex numbers. 5
- (b) With relevant examples, explain : 5
- (i) Multilevel Inheritance
- (ii) Hybrid Inheritance.