(Please write your Exam Roll No.) *Exam Roll No.* 40550404417

END TERM EXAMINATION

SECOND SEMESTER [MCA] MAY-JUNE 2018

Paper Code: MCA-104 ***Subject: Object Oriented Programming in C++***

Time : 3 Hours ***Maximum Marks :75***

Note: Attempt any five questions including Q No.1 which is compulsory.

Question 1. Attempt following in brief: **(Any five)** **(5x5=25)**

a. What is object-oriented paradigm? Explain various features of OOPs.
b. What is polymorphism? Write a program to overload the + operator for manipulating objects of distance class. How do you achieve run time polymorphism?
c. How is an exception handled in C++? Explain with suitable example?
d. What is a Standard Template Library and What does it contain?
e. Discuss Dynamic Memory allocation process? Explain with example.
f. Write a Generic program to make a Stack of type int, float and string. Include all operations for example push, pop, contains etc.

Question 2. Write a short note on following **(Any Three)**:- **(4+4+4.5)**

a. Abstract Class
b. Friend Functions
c. Private Access specifier
d. Constructor & Destructor

Question 3. Differentiate between the following- **(4+4+4.5)**

a. Macro/Inline function
b. Aggregation/Composition
c. Function Overloading/ Function Overriding

Question 4. This section contains three questions. Write the output of code with explanation for each part. Mention if some compilation error may occur. **(4+4+4.5)**

a. CODE A:

```
#include<iostream>
using namespace std;
class base {
   int arr[10];
};
 class b1: virtual public base { };
class b2: virtual public base { };
class derived: public b1, public b2 {};
 int main(void) {
 cout << sizeof(derived);
 return 0; }
```

P.T.O.

b.CODE B:

```
#include<iostream>
using namespace std;
class P {
public:
  void print()  { cout <<" Inside P"; }
};
class Q : public P {
public:
  void print() { cout <<" Inside Q"; }
};
class R: public Q { };
int main(void)
{
 R r;
 r.print();
 return 0;
}
```

c.CODE C:

```
#include<iostream>
using namespace std;

class Base {
private:
   int i, j;
public:
   Base(int _i = 0, int _j = 0): i(_i), j(_j) { }
};
class Derived: public Base {
public:
   void show(){
     cout<<" i = "<<i<<"  j = "<<j;
   }
};
int main(void) {
 Derived d;
 d.show();
 return 0;
}
```

Question 5

a. What are static variable? Explain with example. (6)

b. When do we declare a member of a class as static? What are the characteristics of static members of a class? (6.5)

P.T.O.

Question 6.

a. Can we overload all operators? What are the various operators which can be overloaded? **(6)**

b. Create a class Complex with two data members real and imaginary. Create two suitable overloaded operator functions to increase the number and add two complex numbers. **(6.5)**

Question 7.

a. Why Public, Protected and Private specifiers are used in any C++ program? Explain using suitable example. **(6)**

b. What is virtual base class? How they are used? Explain. **(6.5)**

Question 8.

a. Write a note on function templates and explain how parameters are passed to function template with suitable example. Explain the use of the following notation in a C++ program

```
Template <typename T> Array <T>
        ::Array(int s)
```

(6)

b. What are the various types of inheritance supported in C++? Draw respective diagram. **(6.5)**

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