

(iii) const int* ptr;

(iv) int* float* ptr;

(v) int* const ptr;

- (c) Can we have multiple catch blocks for a single try block? (5)

Write the output:

```
#include<iostream>
using namespace std;
int main()
{
    int x = -10;
    try {
        cout << "Before Error\n";
        if (x < 0) {
            throw x;
            cout << "After Error\n";
        }
    }
    catch (int x) {
        cout << "Exception Caught \n";
    }
    cout << "After catch \n";
    return 0;
}
```

[This question paper contains 12 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 4660

J

Unique Paper Code : 2344001101

Name of the Paper : Programming Using C++

Name of the Course : **Common Prog. Group –
Generic Elective**

Semester : IV

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **all** questions from **Section-A**.
3. Attempt any **four** questions from **Section-B**.
4. Attempt **all** parts of a question together.

SECTION A

1. (a) Write a C++ code to declare a pointer to an integer and assign it the address of a variable. (2)
- (b) Define any **three** characteristics of object-oriented programming paradigm. (3)
- (c) State true or false : (3)
 - (i) A constructor can be called explicitly like a normal function.
 - (ii) A constructor can be declared as 'static'.
 - (iii) A constructor does not have a return type.
- (d) Write the output of the following code fragment : (3)


```
int n = 5;
switch (n != 0) {
    case 1:
        cout << "n is not zero" << endl;
    case 0:
        cout << "n is zero" << endl;
        break;
}
cout << "The square of n is = " << n * n << endl;
```

- (b) How is memory allocation done for objects of a class in C++? (5)
- (c) Write a program in C++ that reads input from the user and writes it to a file. Then, read the contents of the file and display them on the console. (5)
7. (a) Write the output : (5)


```
int x = 0, i;
int a[] = {1, 4, 6, 8};
int *p = a;
for (i = 0; i < 5; i++)
{
    x = 2 * x + i;
}
cout << "Final value of x = " << x << endl;
cout << *p << endl;
(*p)++;
cout << *p << endl;
*p++;
cout << *p << endl;
```
- (b) Identify which of the following are valid pointer declarations. Give reasons. (5)
 - (i) `int*[] ptr;`
 - (ii) `class MyClass; MyClass* ptr;`

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```

(ii) #include <iostream>
using namespace std;
int main()
{
    int A = 15, B = 10, C = 20;
    if (A > B) {
        if (A >= 15) {
            if (C > 10 ? A > 5 ? NULL : 1 : 2) {
                cout << "111";
            }
            else {
                cout << "222";
            }
        }
        else {
            cout << "333";
        }
    }
    else {
        cout << "444";
    }
    return 0;
}

```

6. (a) Explain function overloading in C++. How does function overloading with default arguments cause ambiguity? (5)

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(e) Define inline functions? How are they declared? (3)

(f) Explain the use of static data member in a class with the help of suitable example. (3)

(g) Write the output of the following code fragment : (3)

```

(i) #include<iostream>
using namespace std;
int main()
{
    for(;;)
    {
        cout << "Student";
    }
    return 0;
}

(ii) #include <iostream>
using namespace std;
int* fun()
{
    static int a;
    a++;
    return &a;
}

int main()

```

P.T.O.

```

{
    int* p;
    p = fun();
    p = fun();
    p = fun();
    p = fun();
    cout << "function called " << *p << " times";
    return 0;
}

```

(h) Identify and correct the error in the following C++ code : (3)

```

#include <iostream>
using namespace std;
int main() {
    ifstream file;
    file.open("data.txt");
    file << "Hello, World!";
    file.close();
    return 2;
}

```

(i) Differentiate between multiple inheritance and multi-level inheritance in C++ with the help of an example. (3)

- A data member to store the array and its size.
- A member function inputArray() to input elements into the array.
- A member function findLargest() to find and display the largest element in the array.

(5)

(b) Write the output : (5)

```

(i) #include<iostream>
using namespace std;
int m = 10;
int main()
{   int m = 20;
    {   int k = m;
        int m = 30;
        cout<<k<<endl<<m<<endl<<::m;
    }
    cout <<m<<endl<<::m;
    return 0;
}

```

Add the following member functions to this class with their definitions :

- (i) A default constructor.
- (ii) A parameterized constructor.
- (iii) A copy constructor.

Show how these functions be called from the main function.

4. (a) Write a program in C++ to create a class named 'Calculator' with member functions for addition, subtraction, multiplication, and division. Use objects of the class to perform arithmetic operations on two numbers. (7)
- (b) Describe the concept of 'nesting of member functions' Explain with the help of a C++ program. (8)
5. (a) Write a C++ program to print the Fibonacci series using recursion. (5)
- (b) Write a C++ program using a class named 'Array' to input an integer array and find the largest element. The class should have the following :

- (j) Differentiate between call by value and call by reference with the help of suitable example. (4)

SECTION B

2. (a) Write a C++ program to print the following pattern: Number of rows (say, n) should be taken as input from the user. (5)


```

1
2 3
4 5 6
7 8 9 10
and so on.
```
- (b) Differentiate between compile-time and run-time polymorphism with suitable examples in C++. (5)
- (c) Identify which of the following are valid C++ identifiers. Give reasons. (5)
 - (i) myVariable
 - (ii) 2value
 - (iii) _temp
 - (iv) employee-name
 - (v) student123

3. (a) Consider the code below and answer the following questions – (4)

```
#include <iostream>
using namespace std;
class Base {
public:
    Base() { cout << "Base Constructor\n"; }
    ~Base() { cout << "Base Destructor\n"; }
};
class Derived : public Base {
public:
    Derived() { cout << "Derived Constructor\n"; }
    ~Derived() { cout << "Derived Destructor\n"; }
};
int main() {
    Derived obj;
    return 0;
}
```

- (i) Write the output of the program.
- (ii) Explain the sequence in which constructors and destructors are called in inheritance.
- (b) Write the output : (4)

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

```
int main()
{
    int I = 1;
    int D = 1;
    int R = 0;
    do {
        R = I++ * D++;
        if (I == 3)
            continue;
        cout << R << " ";
    } while (I <= 5);
    return 0;
}
```

- (c) Consider the following class : (7)

```
class Abc
{
    int a;
    .
    .
};
```