

7. (a) Write a program that reads a file and prints the number of lines in it. (5)

(b) What is the output of the following code segment? (5)

```
string s1 = "Hello", s2 = "There!!!",
s3 = "How are you?";
string s = s1 + " " + s2 + " " + s3;
cout << s << endl;
cout << s.length() << endl;
cout << s.substr(7, 3) << endl;
cout << s3.find("are") << endl;
s1.replace(1, 4, "i");
cout << s1 << endl;
cout << s3.find_last_of('o') << endl;
```

(1500)

[This question paper contains 16 printed pages.]

**Your Roll No.....**

**Sr. No. of Question Paper : 1060**

**C**

Unique Paper Code : 32341101

Name of the Paper : Programming Fundamentals  
using C++

Name of the Course : **B.Sc. (Hons.) Computer  
Science**

Semester : I

Duration : 3 Hours

Maximum Marks : 75

**Instructions for Candidates**

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Question No. 1 is compulsory in **Section-A**.
3. Attempt any **four** questions from **Section-B**.
4. Parts of a question should be attempted together.

**SECTION A**

1. (a) Write C++ declarations for the following : (4)

P.T.O.

(i) A function that accepts two integer pointers, one boolean variable and returns an integer.

(ii) Use function overloading to add two numbers when both are :

(a) Integer numbers

(b) Float numbers

and return type of both functions is void.

(b) Change the following while loop code fragment to an equivalent for-loop. (2)

```
cin >> temp;
while (temp != 0)
{
    cout << temp << endl;
    cin >> temp;
}
```

(c) Identify error in the following code segments. Also write the correct code. (6)

```
}
catch (char ex2)
catch (char ex2)
{
    cout << "Division by negative number cannot be
    performed." << endl;
}
}
return 0;
}
// Function definition
int quotient (int first, int second)
{
    char ch= 'y';
    if (second == 0)
    {
        throw 0;
    }
    if(second < 0)
    {
        throw ch;
    }
    return first / second;
}
```

- (b) Define an Abstract class. Can we create objects of an abstract class? (2)
- (c) Write the output of the following code, assuming that user has entered zero and negative value for the variable num2 : (5)

```
#include <iostream>
using namespace std;
int quotient (int first, int second);
int main()
{
int num1, num2, result;
for (int i = 0; i < 3; i++)
{
cout << "Enter an integer: ";
cin >> num1;
cout << "Enter another integer: ";
cin >> num2;
try
{
cout << "Result: " << quotient (num1, num2) << endl;
}
catch (int ex1)
{
cout << "Division by zero cannot be performed." <<
endl;
```

- (i) const int x;
- (ii) int flag = prime(int n);
- (iii) int no of students = 15;
- (d) Assume  $x = 6$ ,  $y = 4$  and  $z = 5$ . Find the values of  $x$ ,  $y$  and  $z$  after evaluation of each of the following expressions. Assume that the execution of statements is independent of each other. (4)
- (i)  $x++ + y$
- (ii)  $x \ \&\& \ y \ || \ z$
- (iii)  $x - 2 * y + y < z * 2 / 3$
- (iv)  $(4 + 5 * y - 4) \ \&\& \ (z - 2)$
- (e) Find error(s) and write the correct code, in the following programs: (4)

```
(i) # include<iostream>
using namespace std;
class Sample
{
private:
```

```

int a1, a2, a3;
public:
Sample(int i, int j, int k)
{
    a1 = i;
    a2 = j;
    a3 = k; }
void display() const
{
    cout<<a1<< " "<<a2<< " "<< a3;
}
};

int main()
{
Sample s1(1, 2, 3), s2;
s1.display();
s2.display();
return 0;
}

```

```

public:
void indata (int, int)
void outdata( );
};
class Pet : public Animal
{
int herbiv;
public:
void display (void);
};

```

- (i) Name the derived class of the class Animal.
- (ii) Define the statements to declare the objects of class Animal, Wild and Pet. Write suitable statements for the data members of classes that are accessible in main(). Give the reasons for the data members that are not accessible in main().
6. (a) Write a program to find the factorial of a number. Number should be entered as a command line argument. (3)

1060

12

5. (a) Differentiate between Constructor and Copy Constructor. Give three situations in which a copy constructor is used. (5)

(b) Consider the following declarations and answer the questions given below : (5)

```
class Animal
{
int leg;
protected:
int tail;
public:
void input(int);
void out( );
};
class Wild : private Animal
{
int carniv;
protected:
int teeth;
```

1060

5

```
(ii) # include<iostream>
using namespace std;
class Sample2
{
private :
static int count;
public :
Sample2( )
{
count++;
}
void display( ) const
{
cout<<count;
}
};
int main()
{
Sample2 s1, s2;
s1.display();
```

```

        s2.display();
        return 0;
    }

```

(f) What will be the output of the programs given below : (5+5)

(i) void fun (int x, int \* y)

```

    {
        x = 6;
        (*y) += 2;
    }

    int main( )
    {
        int a[5] = {2, 4, 6, 8, 10};
        int b = 5;
        for (int i = 0; i < 5; i ++)
        {
            fun (a[ i ], &b);
            cout << a [ i ] << "\t" << b << endl;
        }
        return 0;
    }

```

(b) What is the purpose of static members of a class? Explain with suitable example. (5)

4. (a) What is run time polymorphism? Explain it with the help of suitable example. (5)

(b) A point on the two-dimensional plane can be represented by two numbers: (5)

an x coordinate and a y coordinate.

Write a program that declares a class called Point to model a point in 2-D plane. The class comprises of the following:

(i) Two private data members to store the x and y coordinates.

(ii) A parameterised constructor for setting the values for the data members.

(iii) Overload + operator as a member function to add two Point objects P1 and P2 (the sum of two points can be defined as a new point whose x coordinate is the sum of the x coordinates of the two points, and whose y coordinate is the sum of the y coordinates).

1060

10

```
class B : public A {
    char b;
public:
    B() {
        b = 0;
        cout << "\nIn B";
    }
    B(char x) {
        b = x;
        cout << "\nIn B with b = " << b;
    }
    ~B() { cout << "\nDestroying B"; }
};

int main()
{
    B obj1('z');
    A obj2(10);
    return 0;
}
```

1060

7

```
(ii) #include <iostream>
using namespace std;
void fun (int x)
{
    if (x < 10) throw 10.0;
}
int main ()
{
    try
    {
        fun (5);
    }
    catch (double value)
    {
        cout << value << endl;
    }
    return 0;
}
```

P.T.O.

- (g) (i) Name any two stream classes commonly used for file I/O.
- (ii) Rewrite the following code using if-else statement-

```
int n, k = 5;
n = (100 % k ? k + 1 : k - 1);
cout << "n = " << n << " k = " << k << endl;
(2+3)
```

### SECTION B

2. (a) Write a function findPrimes( ) that receives two numbers as arguments and displays all prime numbers between these two numbers. In case no arguments are passed, 2 and 20 should be treated as the default arguments.

Write main() program for calling the function findPrimes(), with –

- (i) two arguments from the user
- (ii) default arguments. (6)

- (b) Write the definition of a function that accepts two arrays of integers, arr1 and arr2, as parameters. The function compares the two arrays for equality and returns true or false. Assume that the size of both arrays is same. (4)

3. (a) What is the output of the following code segment? (5)

```
class A {
    int a;
public:
    A() {
        a = 0;
        cout << "\nIn A";
    }
    A(int x){
        a = x;
        cout << "\nIn A with a = " << a;
    }
    ~A() { cout << "\nDestroying A"; }
};
```