

[This question paper contains 8 printed pages.]

Sr. No. of Question Paper : 771 G Your Roll No.....

Unique Paper Code : 234101/251305

Name of the Paper : Programming Fundamentals (CSHT-101)/CS-I  
Fundamentals of programming Languages

Name of the Course : B.Sc. (H) Computer Science/B.Sc. (H) Electronics

Semester : I / III

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. There are **two** parts of the question paper.
3. **Part I** : All its questions are compulsory.
4. **Part II** : Attempt any **four** out of six.

**PART I**

*Question No. 1 is compulsory.*

1. (a) What is the output of this following program segments ?

(i) `int x=0, y=0, z=1;`

`if(z=x<y) {`

`x+=3;`

`y-=1;`

`}`

`else x=y++;`

`cout<<"x"<<x<<"y"<<y<<"z"<<z;`

(2)

*P.T.O.*

```
(ii) int x=0,y=0;
    switch(x) {
    default: y=3;
           x=1;
    case 0: x=2;
           y=3;
    case 1: x=4;
           cout<<"x="<<x"<<y="<<y;
    }
```

 (2)

```
(iii) int a=1; b=2, c=7;
      a += b *= c -= 5;
```

 (2)

```
(iv) void main() {
      char *x= "Programming Fundamentals";
      cout << *x << *(x+2) << *(x+4);
    }
```

 (2)

```
(v) int main()
    {
    int A[10]= {4,1,9,3,2,5,6,2,8,7 }
    cout<<A[2]<<endl;
    cout<<A[A[2]]<<endl;
    cout<<A[A[1]+A[3]]<<endl;
    cout<<A[A[A[2]]]<<endl;
    return 0;
    }
```

 (2)

- (b) Find the error(s) if any in the following program segments. Also correct the errors.

(i) `int func(int m = 10, int n)`

```
{  
    int c;  
    c = m + n;  
    return c;  
}
```

`int main()`

```
{  
    cout << func(5);  
    return 0;  
}
```

(2)

(ii) `void func(int x,int y)`

```
{  
    int z;  
    z=x+y;  
    return z;  
}
```

(2)

(iii) `void Fun:: ~Fun(void) {`

```
....;  
}
```

(2)

- (c) Assume  $x = 2$ ,  $y = 3$ , and  $z = 1$ , evaluate each of the following expression :

(i)  $z - (x + y) \% 2 + 4$       (ii)  $x /= 3 * y + z$       (3)

(d) Differentiate between pass-by-reference and pass-by-value with the help of suitable example. (3)

(e) Consider the following class definition :

```
Class X {  
    int a[10], size;  
    char c;  
public:  
    ...  
};
```

Write the definition of copy constructor for the class X. (3)

(f) What is inline function ? Explain. (3)

```
(g) class X {  
    int x;  
    public: int y;  
        void f();  
    protected: int z  
        void g();  
};
```

```
class Y: private X {  
    .  
    .  
public: void func();  
};
```

What data members and functions are accessible in function func() ? Give reasons in support of your answer. (3)

(h) Differentiate between a class and a structure with the help of suitable example. (2)

- (i) Explain the use the following two getline() functions :

```
getline(cin, str, ',')
```

```
getline(cin, str)
```

(2)

### PART-II

2. (i) Give the output of the following program segment :

```
int a=10,*p1;
```

```
char c='r', *p2;
```

```
float b=10.5, *p3;
```

```
p1 = &a; p2 = &c; p3 = &b;
```

```
cout<<sizeof (p1)<< sizeof (*p1) << *p1;
```

```
cout<<sizeof (p2)<< sizeof (*p2);<< *p2;
```

```
cout<<sizeof (p3)<< sizeof (*p3);
```

(4)

- (ii) Assume an array with following content :

80 72 66 44 21 33

After two passes of a sorting algorithm, the array has been rearranged as shown below :

21 33 66 44 80 72

Which sorting algorithm is being used (Selection, Insertion or Bubble sorting) and why ?

(6)

3. (i) Design a class complex for complex number and overload \* operator to multiply two complex numbers. (6)

- (ii) Static member function can use static data members only. Explain with a suitable example. (4)

4. (i) Give output of the following code :

```
class A {
    int x;
    public:
    void print(){cout<<"Base class";}
};

class B: public A {
    int y;
    public:
    void print(){cout<<"Derived class";}
};

int main()
{
    A*p;
    A a;
    B b;
    p=&a;
    p->print();
    p=&b;
    p->print();
}
```

(4)

- (ii) Write a program to copy a given file with prefixing line numbers in each line. (6)

5. (i) Differentiate between a virtual function and a pure virtual function with the help of examples. (4)

- (ii) Design a class Matrix and write a friend function to multiply two matrices. (6)

6. Write the output of the following code :

(i) void Print(int N)

```
{
    int Num;
    Num = 1;
    while (true) {
        if (Num >= N)
            throw Num;
        cout<< Num;
        Num++;
    } // end while
} // end Print

int main()
{
    try {
        Print(20);
    }
    catch(int ExNum)
    {
        cout << "Caught an exception with value:" << ExNum;
    }
    return 0;
}
```

(5)

```

(ii) class X {
    protected: int x;
    public : X( ) {x=0; cout<<"Constructor in Base Class X invoked\n";}
        ~X( ){cout<<"Destructor in Base Class X invoked\n";}
    }
class Y: public X {
    protected: int y;
    public : Y( ) {x=0; y=0; cout<<"Constructor in Derived Class Y invoked\n";}
        ~Y( ) {cout<<"Destructor in Derived Class Y invoked\n";}
    };
class Z: public Y {
    public : Z( ) {x=0; y=0; cout<<"Constructor in Derived Class Z invoked\n";}
        ~Z( ) {cout<<"Destructor in Derived Class Z invoked\n";}
    };
int main() {
    Z obj;
    return 0;
}

```

(5)

7. (i) Write a recursive function to print an array of size n. (5)
- (ii) Write a for loop to print first 10 numbers of the series 1,4,7,10..... (2)
- (iii) With two C++ statements, explain the purpose of showbase and showpoint input/output stream (ios) flags. (3)