

5. (a) Write a C++ program that reads a text file and creates another file that is identical to the first except that every sequence of consecutive blank spaces is replaced by a single space. (5)
- (b) Write a recursive function to compute sum of first 10 natural numbers. (5)
6. (a) Create a class TwoDim which contains x and y coordinates as int. Define the following :
- default constructor to initialize data members to zero
 - parameterized constructor to initialize data members to values passed
 - function print() to print the coordinates of the class. (6)
- (b) Explain the purpose of using the key word 'const' with data and function members of a class. (4)
7. (a) What are static variables and static functions? How are static variables initialized? What is the purpose of static variables and static functions? (5)
- (b) Write a program to swap two numbers using pointers. (5)

(1400)

[This question paper contains 6 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6501

HC

Unique Paper Code : 32341101

Name of the Paper : Programming Fundamentals using C++

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

Semester : I

Duration : 3 Hours

Maximum Marks : 75

Instructions for Candidates

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

Section-A

- What is polymorphism in OOP? (2)
- Why don't the constructors have return type? (2)
- How do you overload '+' as post-increment operator? Give an example to illustrate overloading of '+' as post-increment operator. (4)

P.T.O.

(d) Find errors in the following code segments: (4)

```
i.   int func(int x,y)
      {
      int z;
      cout << z;
      }
```

```
ii.  class du
      {
      private:
      ...;
      public:
      void ~du(void);
      }
```

(e) How do the properties of the following two derived classes A and P differ?

```
i.   class A: private B{//.....};
ii.  class P: public B{//.....}; (4)
```

(f) What is 'this' pointer? Explain with an example. (2)

(g) Give output of the following code segments : (4)

```
i.   x=12;
      while(x>7){
          cout <<x<<endl;
          x-=2;}
ii.  for (int x = 20;x>=1; x--)
      {
          for (int y = x; y>=1, y--)
              cout << " ";
          cout << x;
      }
```

(h) When do we make a virtual function "pure"? What are the implications of making a function a pure virtual function? (3)

(b) What is a copy constructor? Give an example of a copy constructor. (4)

(c) Give the output of the following program : (3)

```
int x=2, y;
int main()
{
  cout<<"x"<<x;
  cout<<"y"<<y;
  func();
  cout<<"x"<<x;
  cout<<"y"<<y;
  return 0;
}
```

```
void func()
{
  int x=7;
  y=11;
  cout<<"x"<<x;
  cout<<"y"<<y;
}
```

4. (a) What is function overloading? Explain with the help of suitable example. (6)

(b) What is the sequence of constructors and destructors being called in the following multilevel inheritance : (4)

```
class A
{...};
class B:public A
{...};
class C:public B
{...};
class D:public C
{...};
```

- (b) Assume a class D derived from a base class B. Class B is a friend of class A. Can class D access private data of class A? Justify your answer. (5)
3. (a) Identify error(s) in the following code : (3)

```
class Fun
{
    private:    int x;
    protected: int y;
    public:    int z;
};
class Funny: public Fun
{
    private:    int u;
    protected: int v;
    public:    int w;
};

int main()
{

    Fun fun;
    Funny funny;
    fun.x = 1;
    fun.y = 2;
    fun.z=3;
    funny.x=11;
    funny.y = 12;
    funny.z=13;
    funny.u=14;
    funny.v=15;
    funny.w=16;
}
```

- (i) How is a **structure** different from a **class** in C++? (2)
- (j) What are inline functions? When will you make a function inline? (3)
- (k) Which one of the following is a valid function declaration? Justify your answer. (2)
- i. `int f1(int i=1, int j=2, int k);`
 - ii. `int f1(int i=1, int j, int k=2);`
 - iii. `int f1(int i, int j=2, int k=3);`
- (l) Explain the following string functions with suitable example : (3)
- (i) `compare()`
 - (ii) `find()`
 - (iii) `replace()`

Section-B

2. (a) Write a C++ program to convert a two-dimensional array `A[4][4]`, into a one-dimensional array `B[16]` that will have all the elements of `A` if they are stored in row-major form. For example, if array `A[4][4]` is :

1	2	3	4
5	6	7	8
9	10	11	12
13	14	15	16

Then `B[16]` is { 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 } (5)