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Your Roll No. 7047707

5198

B.Sc. (Prog.)/II

H

CS-201—PROGRAMMING AND DATA STRUCTURE

(New Course : Admission of 2005 onwards)

Time : 3 Hours

Maximum Marks : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

All questions are compulsory.

Give the output of code segments (wherever required).

1. Give the output of the following code segments :

(a) Void main ()

2

```
{ int m = 5 ;
```

```
do
```

```
{ cout << "m =" << m << endl ;
```

```
  m = -1 ;
```

```
  } while (m > 0) ;
```

(b) Void main ()

2

```
{ int arr [ ] = {0, 1, 2, 3, 4} ;
```

```
int i, * ptr ;
```

P.T.O.

```
for (p = arr + 4, i = 0; i <= 4 ; i++)
```

```
    cout << * (p - i)
```

```
    }
```

2. (a) What is the difference between break and continue ?

Explain using examples.

4

- (b) class A

3

```
{
```

```
    public : virtual void show ( ) = 0 ;
```

```
};
```

```
class B : public A
```

```
{
```

```
    public : void display ( )
```

```
    {cout << "B" ; }
```

```
};
```

```
class C : public A
```

```
{
```

```
    public :
```

```
        void show ( )
```

```
        { cout << "C"; }
```

```
};
```

Which of the following statements are illegal ?

(i) C c1 ;

(ii) A a1 ;

(iii) B b1 ;

3. (a) Write a C++ function to copy one string to another. 4

(b) Void swap (int *x, int *y)

5

```
{
```

```
    int *temp = *x;
```

```
    *x = *y ;
```

```
    *y = *temp ;
```

```
    cout << " *x = " << *x << endl ;
```

```
    cout << " *y = " << *y << endl ;
```

```
}
```

```
void main ( )
```

```
{ int x = 10 ;
```

```
  int y = 20 ;
```

```
  swap (&x, &y) ;
```

```
  cout << " x = " << x << endl ;
```

```
  cout << " y = " << y ;
```

```
}
```

- (i) What type of argument is passed to function 'swap' ?
- (ii) What is this type of argument passing called ?
- (iii) What type of variable is 'temp' ?
- (iv) What will be the output of the above code segment ?
4. (a) What will be the scope of the following data members in the given code segment : 3
- (i) data member 'a' in 'derived'.
- (ii) data member 'b' in 'derived'.
- (iii) data member 'c' in 'derived'.

Class Base

```
{
    private :
        int a ;

    protected :
        int b ;

    public :
        int c ;
};
```

Class derived : Private Base

```
{ };
```

- (b) What are the values of m and n after the following two statements are executed ? 1
- ```
int m = 1, n = 0 ;
n = m++ ;
```
5. Write a C++ program to :
- (a) Define a Class Bank having two private data members account-no (static member) and balance. 1
- (b) Define a default constructor which initializes the data member balance to zero and increments account-no by one. 2
- (c) Define a public data member show ( ) to display the values of data members. 1
- (d) Define a function deposit ( ) which accepts the deposit amount and adds it to the balance. 2
- (e) Define a function withdraw ( ) which accepts the withdrawal amount and subtracts it from the balance (only if the balance is greater than or equal to the withdrawal amount else displays appropriate message). 2

- (f) Overload- -(decrement operator) which withdraws Rs 1,000 through the withdraw function. 2
- 6. (a) Evaluate the following postfix expression : 4

(A = 1, B = 2, C = 3)

A B - C + A B C - + \$

- (b) Apply Bubble sort (ascending order) algorithm on the following list of numbers showing outcome after each iteration : 4

25, 57, 48, 37, 12, 92, 86, 33

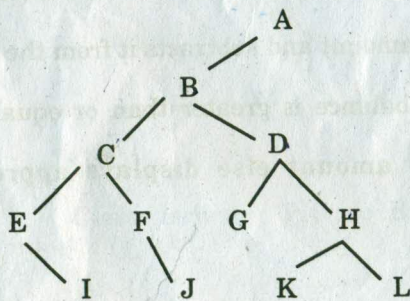
- (c) Transform the following : 4

(A + B) \* (C - D) \$ E \* F

(i) Infix to Postfix

(ii) Infix to Prefix

- 7. (a) Give inorder, preorder and postorder traversal of the following Tree : 6



- (b) What are the advantages of using linked list over arrays ? 3
- (c) Evaluate fib (10) using recursive definition of Fibonacci series! 3
- (d) Show step-wise outcome of the following operations on an empty queue of size 4 : 3
  - insert (15)
  - insert (19)
  - insert (23)
  - remove ( )
  - insert (11)
  - insert (95)
- 8. (a) Write a C++ program for sequential search. 4
- (b) What is the difference between a binary tree and a binary search tree ? 2
- (c) Write functions to perform the following on a singly linked list. 8
  - (i) Delete an element after the nth element of a list.
  - (ii) Insert an element after the nth element of the list.