

Con. 5907-09.

SP-8438

(3 Hours)

[Total Marks : 100

- N.B.** (1) Question No. 1 is compulsory.  
 (2) Attempt any four questions from remaining six questions.  
 (3) Assume any data if required and state the assumption.

1. (a) What is object oriented programming paradigm ? List the basic concepts of it ? **10**  
 Explain each concept.

(b) What is the output of the following programs :— **10**

(i) 

```
#include<iostream.h>
void main()
{
    int i=1,j=1;
    for (;;)
    {
        if(i>3) break;
        else j+=i;
        cout<<j <<endl;
        i+=j;
    }
}
```

(ii) 

```
#include<iostream.h>
void main()
{
    int k=3, l=4, m;
    m=++k + l--;
    cout<<"Value of m"<<m<<endl;
    m=k++ + --l;
    cout<<"Value of m"<<m<<endl;
}
```

2. (a) Write a program that simulates a simple calculator. It reads two integers and one character. If the character is a +, the sum is printed; if it is a -, the difference is printed; if it is a \*, the product is printed, if it is a /, the quotient is printed and if it is a %, the remainder is printed. (Hint : Use a switch statement.) **10**

(b) Write a program that calculates the square roots of a quadratic equation. **10**

3. (a) Explain storage class with one programming example. **10**

(b) Write a program to read elements of a square matrix and print the trace (i.e., the sum of the main diagonal elements) of a two-dimensional square array of integers. **10**

For example, it would return 46 for the array

11	22	33
40	20	60
35	25	15

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4. (a) Explain recursion and write a recursive program for calculating factorial of a given number N. 10

(b) Write a program that reads a positive integer n and then prints a triangle of asterisks in n rows. If n=4, then the output would be 10

```

*
* *
* * *
* * * *
    
```

5. (a) Explain Call-by-value and Call-by-reference with example. 10

(b) Write a program to find area of circle, area of rectangle and area of triangle using function overloading. 10

6. (a) Write a program that reads any positive integer n and prints the digits in words. (For example, if input is **1265** then output is **one two six five**). 10

(b) Write a program to check whether a given string is palindrome or not. 10

7. (a) What is virtual function ? What is the need of virtual function ? 5

(b) What do mean by dynamic initialization of variables ? How it is achieved ? Give an example. 5

(c) Explain the difference between a constructor and a destructor in C++. 5

(d) Explain Bit wise operators in C++. 5

