SUBJECT : COMPUTER SCIENCE (SET-I)

Time : 3 Hrs. M.M.: ⬚

General Instructions :

1. *All question are compulsory.*

2. *Programming language : C++.*

Q1. (a) What role does the output unit play in a comput⬚

(b) What are the differences between hardware a⬚ firmware? Give examples.

(c) What is operating system? Explain any two types⬚ operating system.

(d) Convert the following :

(i) $(73276)_8$ to hexadecimal

(ii) $(1723)_{10}$ to binary

(iii) $(7FD)_{16}$ to decimal

(e) Find the eight bit two's complement form of ⬚ following decimal number : $(-101)_{10}$

Q2. (a) What are the two categories of printers? Which t⬚ of printers are more speedy? Explain each type w⬚ example.

(b) Write a program to input three sides of a trian⬚ and to find area of triangle using hero's formula⬚

(c) What is paradigm? What do you understand⬚ modular programming?

(d) (i) What is Inheritance? Explain with an exam⬚

(ii) What is base class? What is derived class? ⬚ are these two interrelated?

Q3. (a) What are tokens in C++? How many types of tok⬚ are allowed in C++? Explain any three tokens ⬚ example.

Print all information on the output screen. (4)

(b) (i) Write any four characteristics of a good program. (⬚)

(ii) What is program documentation? (1)

(c) Give the output of the following program :

```
# include <iostream.h>
int global = 10;
void func (int & x, int y)
{    x = x - y; y = x * 10;
     cout<<x<<','<<y<<'\n';
}
void main( )
{    int global = 7;
     func(::global, global);
     cout<<global<<','<<::global<<'\n';
     func(global, :: global);
     cout<<global<<','<< :: global <<'\n';
}
```
(2)

(d) Find the error, if any in the following program :

```
#include <iostream.h>
void main( )
{    int i = 10, j = 5, k;
     k = sum(i, j);
     cout>>k;
}
void sum(int i, j)
{    return(i * j);
}
```
(2)

(b) Differentiate between run time error and logical error. (2)

(c) Explain the following data type with an example : (3)
  (i) class   (ii) Pointer
  (iii) int

(d) What is a variable? How many values are associated with it? (1)

Q4. (a) What is meant by type conversion? What is explicit type conversion? Explain with an example. (2)

(b) Write a C++ program to input a number. If the number is positive and odd, print its square otherwise print its cube. (2)

(c) (i) How many times the following loop will execute. Explain :

```
i = 10; s = 0;
while (++i<15)
{
    cout<<i<<'\t';
    s+=i;
}
cout<<" sum = "<<s;
```
(2)

  (ii) Rewrite the above code using for loop. (2)

(d) Study the following program and select the possible output(s) from the options given : (2)

```
#include <iostream.h>
#include<stdlib.h>
const int MAX = 3;
void main()
{   randomize()
    int number;
    number = 50 + random (MAX);
    for (int P = number; P >= 50; P - - )
        cout <<P<< '#';
    cout <<endl;
}
```

(i) 53 # 52 # 51 # 50 #   (ii) 50 # 51 # 52 #
(iii) 50 # 51 #   (iv) 51 # 50 #

Q5. (a) Name the header file to which the following built in functions belong to : (2)
  (i) setw()   (ii) random()
  (iii) toupper()   (iv) strcmp()

(b) Explain the following with an example : (4)
  (i) Local Scope   (ii) Call by value
  (iii) Function Scope   (iv) Formal parameter

(c) Write a function that takes two int arguments and return −1 if the first number is divisible by the second number and 1 if the first number is not divisible by the second number. Write a main program to test your function. (3)

(d) Why we need function prototype? (1)

Q6. (a) (i) What do you understand by single dimensional array? What is the significance of single dimensional array? (1)
  (ii) Determine total bytes required and number of elements to store A[25][20], a float array. (1)

(b) Write a program to input n numbers and to arrange all numbers in ascending order. (3)

(c) Write a program to input any two matrices and to implement matrix with matrix multiplication. (4)

Q7. (a) Write a program to input n students information with rollno, name, class marks in five subjects and to find total, average and grade value. Grade is calculated by using following information.

Average	Grade
> = 90	A
< 90 && > = 80	B
< 80 && > = 70	C
< 70 && > = 60	D
< 60	E