Roll No. ☐☐☐☐☐☐☐☐☐☐☐

S. No. of Question Paper : **5003**

Unique Paper Code : **234161**   **D**

Name of the Paper : **Fundamentals of Programming (CSPT-101)**

Name of the Course : **B.Sc. /Math. Sc.**

Semester : **I**

Duration : **3 Hours**   Maximum Marks : **75**

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

Question No. **1** is compulsory.

Attempt any *five* questions from Q. No. **2** to Q. No. **8**.

All parts of a question must be attempted together.

1. (*a*) What is the output of the following program segment ?   2

   a = 20;

   b = a++;

   c = ++a;

   cout << b << c;

   (*b*) void main( )   2

   {

   inti;

```
        for (i = 0; i < 5; i++)

                f( );

}

void f( )

{

        static int j;

            j++;

        cout <<j<< endl;

}
```

(c)   Write the code for an infinite while loop.   2

(d)   What is a pure virtual function ? Give suitable example.   2

(e)   What is the output of the following code ?   2

```
int main( )

{    intarr [ ] = {0, 1, 2, 3, 4};

inti, *ptr = arr;

for (i = 0; i < 5; i++)

cout<< * (p + i);

}
```

(*f*)   Write a statement to find maximum of two numbers using ternary operator.   2

(*g*)   What are preprocessor directives in C++ ? Give examples.   2

(*h*)   Write the prototype of a function that accepts two arguments and returns an integer. Each argument is a pointer to an integer.   2

(*i*)   Differentiate between private and protected data members of a class.   2

(*j*)   When do you prefer to use a friend function ?   2

(*k*)   List any *two* properties of a constructor function.   2

(*l*)   Explain the functions of break, continue and exit().   3

2.   (*a*)   Write a C++ program to create a class Time having hrs and minutes as integer data members. Write default and parameterized constructors to initialize the objects of class Time. Write a function to add two objects of class Time.   8

(*b*)   Write the names of header file which are to be included if the following functions are used :   2

(*i*)   setw()

(*ii*)   sqrt()

3.   (*a*)   Write a program in C++ to compute the area of a square, area of rectangle and area of a triangle using the concept of function overloading.   8

(*b*)   How constructors and destructors are invoked in case of inheritance ?   2

4. (*a*) Give the output of the following code : 3

```
# include < iostream. h>

class Base

{    public :

        void show( )

        {    cout<<"Inside base class\n";}

};

class Derived public Base

{    public :

        void show( )

        {    cout << "Inside derived class\n";}

};

void main( )

{    Base *p;

    Derived d;

    p = &d;

    p->show ();

}
```

(*b*) Write a program to multiply *two* matrices. 7

5. (a) List two built-in data types, two user defined data types and *two* derived data types that are used in C++.   6

    (b) What is the difference between function overloading and function overriding ?   4

6. (a) What is copy constructor ? In which situations it is invoked ?   5

    (b) Write a recursive function to find the nth term of the Fibonacci series.   5

7. (a) What are the advantages of using exception handling mechanism in a program ? When is a catch(...) handler used ?   7

    (b) List *three* operators which can not be overloaded.   3

8. (a) Write a program to read marks of 20 students from the user and and create a text file to store them.   7

    (b) Differentiate between structure and union.   3