This question paper contains **8+3** printed pages]

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S. No. of Question Paper : **1773**

Unique Paper Code : **32341101**   **GC-3**

Name of the Paper : **C1-Programming Fundamentals using C++**

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

Semester : **I**

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

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

The question paper consits of *two* Sections.

Section A is compulsory.

Attempt any *four* questions from Section B.

Section A

(Compulsory)

1. (*a*) What are the different ways to code constants in a C++ program ? Give examples. 3

    (*b*) Given the following declarations :   2

    int m = 1, n = 2, i = 1, j = 5;

    Evaluate the values of the expression, and state the values of each of the variables after the expression is evaluated.

    i--&&(4 * ++m <=n)

P.T.O.

(c) Give the output of the following code fragments :

(i)   int n = 5;   2

if (n = 0)

cout <<"n is zero"<<"\n";

else

cout <<"n is not zero" <<".\n";

cout <<"The square of n is" <<n * n <<"\n";

(ii) int n, k = 5;   2

n = (100% k ? k + 1 : k − 1);

cout <<"n ="<<n<<" k = " << k<< endl;

(iii) int list[] ={2, 4, −5, 6, 7, 0, −1, 6};   3

bool pos = true;

int i = 0;

while (pos && list[i]!=0)

   pos = (list[i++]>0);

cout<<"The final output is:"<<pos<<"for i ="<<i;

(*iv*) int i1 = –254;   2

```
float f1=53.6456;

int i2=8;

cout <<<<"i1"<<setw(7)<<i1<<"i2"<<setw(4)<<i2;

cout.setf(ios::fixed, ios::floatfield);

cout <<setprecision(2);

cout <<"f1"<<f1;

cout.setf(ios::oct,ios::basefield);

cout <<"octal of i2"<<i2;
```

(*v*) **string** x="FROM:abcd@rmail.com";   2

```
int colonPos=x.find(':');

string prefix=x.substr(0,colonPos);

string suffix = x. substr(colonPos+1);

cout<<"-This message is from"<<suffix<<endl;
```

(*vi*)   string str1 ("Brick house");   3

string str2 ("Mud house");

string str3("concrete");

if(str1.compare(6, 5, str2) = =0)

   cout<<str1<<"is same as"<< str2<<"\n";

else

   cout<<str1<<"is not same as"<< str2<<"\n";

string newstr=str1.substr(0,5);

newstr.append(str2);

cout<<"New string."<<newstr<<"\n";

newstr.replace(5,3,str3);

cout<<"Now New string."<<newstr<<"\n";

(*vii*) # include<iostream.h>   4

```cpp
class base

{

      int no1;

public:

    int no2;

  base()

{cout<<Base Constructor\n";}

      voit getdata();

      int getno1();

      void showno1();

};
```

```
Class derived : public Base
{
int no3;
public:
derived()
{cout<<"Derived Constructor\n";}
    void add();
    void display();
};
    void base :: getdata(0
{
no1 = 10;
no2 = 20;
}
int base :: getno1()
{
return no1;
}
void base :: showno1()
{
cout<<"Number 1 ="<<no1<<"\n";
}
void derived :: add()
{
no3 = no2 + getno1();
}
```

```cpp
void derived :: display()

{

cout<<"Number 1 ="<<getno1( )<<"\n";

cout<<"Number2 ="<<no2<<"\n";

cout<<"Sum"<<no3<<"\n";

}

main( )

{

derived d;

d.getdata( );

d.add( );

d.showno1( );

d.display( );

d.b = 100;

d.add( );

d.display ( );

return 0;

}
```

(d) Point out the errors in the following code fragment :

2+2

(i) intf(int *aa, int &bb)

```
{
        &bb = 8;

        aa[1] = bb[2];

        aa[0] = bb;

}
```

(ii) class try

```
{int k;

public:

        void try(int 1)

        {k=1;}

        friend void func(try &t);

};

void func(try &t)

{cout<<t.k;}

int main()

{try t1(2); tryt2(3);

  t1.func(t2);

return 0;

}
```

(e) Write a function that replaces all vowels in a character array with asterisk (*).   4

(f) What is exception specification ?   2

(g) Name the *four* standard streams in C++.   2

Section B

2. (a) Rewrite the following for statement as an equivalent while statement :   3

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

    if(input_line[i]=='?')

quest_count++;
```

(b) Write C++ declarations for the following :   1+2

(i) A pointer to an array of 10 integers.

(ii) A function accepting an array of integers and a character parameter and returning a pointer to an integer.

(c) Write a C++ function that takes in one integer parameter and returns 0 if the number is a palindrome and 1 otherwise. The parameter must be passed by reference.   4

3. (a) What are inline functions ? How are they declared ?   3

(b) What are static members of a class ? How are they accessed ? Explain with example.   3

(c) Write a function that swaps two integers using pointers.   4

4.   (*a*)   Write a function that prints the following pattern for a given integer n. The following pattern is printed for n=3.   4

      1

      22

      333.

  (*b*)   Consider the following class :

Class Circle

{

      float radius;

};

Add the following member functions to this class with their definitions :

(*i*)   A default constructor;

(*ii*)   A parameterized constructor;

(*iii*)   A function that computes the area.

Show how will these functions be called from main function.   6

5. (*a*) Create a class Time with three data members : hours, minutes and seconds. Write member functions to overload unary increment (++) operator that increments the corresponding hours, minutes and seconds of the class time. Write code for both prefix and postfix versions of the same. 6

(*b*) Write a program that reads a text file and prints the number of characters in it. 4

6. (*a*) Explain the difference between function overloading and function overriding with suitable examples. 4

(*b*) Consider a following class : 3

class base

{int p1;

protected:

　int p2;

public:

　int p3;

}

What will be the access type of p1, p2 and p3 in class deri if :

(*i*) class deri : private base

　{

　};

(ii) class deri : protected base

{

};

(iii) class deri : public base

{

};

(c) Write a program that accepts a string through command line arguments and prints its length. 3

7. (a) Create a base class shape with two data members length and breadth and virtual function area. Derive a class rectangle with public inheritance. Override the function area. How can you call the two area functions by using a single pointer to the base class ? Show. 2+2+2

(b) (i) What is a generic catch statement in exception handling ? 2+2

(ii) Can an exception be handled only in the current function ? Explain your answer.