DHEERAN VIDHYAALAYAA MATRIC HR SEC SCHOOL

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Std: 11th **13.03.2020**

Subject: Computer Science **Answer Key** **Marks:70**

PART-I

1. d) Monitor
2. d) NOT
3. a) 3
4. b) My document
5. c) 13,3
6. c) 5
7. a) Tokens
8. c) break
9. d) isalnum()
10. c) 5
11. b) class
12. a) copy constructor
13. b) +
14. d) constructor
15. a) computer ethics

PART-II

16. What are the functions of an ALU?

The ALU is a part of the CPU where various computing functions are performed on data.

The ALU performs arithmetic operations such as addition, subtraction, multiplication, division and logical operations. The logical operations of ALU promote the decision-making ability of a computer.

17. Convert the given binary number$(11.011)_2$ into its decimal equivalent.

Ans: 3.375

18. What is recursion?

Recursion are algorithm design techniques to execute the same action repeatedly (or)

Recursion is another algorithm design technique, closely related to iteration. (or)

A function that calls itself is known as recursive function. And, this technique is known as recursion.

19. Write a note on break and continue statement in C++.

Break	Continue
Break is used to terminate the execution of the loop.	Continue is not used to terminate the execution of loop
It breaks the iteration	It skips the iteration
When this statement is executed, control will come out from the loop and executes the statement immediate after loop	When this statement is executed, it will not come out of the loop but moves/jumps to the next iteration of loop
Break is used with loops as well as switch case.	Continue is only used in loops, it is not used in switch case.

20. Write the syntax and example of if statement.

Syntax:

```
if ( expression)
             {
            True-block;
            }
else
             {
             False-block;
            }
Statement-x
```

Example:

```
#include <iostream>
using namespace std;
int main()
{
int num, rem;
 cout<< "\n Enter a number: ";
 cin>>num;
 rem = num % 2;
 if (rem==0)
            cout<< "\n The given number" <<num<< " is Even";
 else
             cout<< "\n The given number "<<num<< " is Odd";
return 0;
}
```

21. What are the importance of void data type?

- To indicate the function does not return a value
- To declare a generic pointer.

22. What is polymorphism?

Polymorphism is the ability of a message or function to be displayed in more than one form

23. What is TSCII?

TSCII (Tamil Script Code for Information Interchange) is the first coding system to handle our Tamil language in an analysis of an encoding scheme that is easily handled in electronic devices, including non-English computers. This encoding scheme was registered in IANA (Internet Assigned Numbers Authority) unit of ICANN

24. If a=65, b=15 then find (i) a&b (ii) a^b

Ans: (i) 1

(ii) 78

PART-III

25. Write the truth table of fundamental gates.

The fundamental gates are AND, OR and NOT gates.

Truth table of AND Gate.

Input		Output
A	B	C
0	0	0
0	1	0
1	0	1
1	1	1

Truth table of OR Gate.

Input		Output
A	B	C
0	0	0
0	1	1
1	0	1
1	1	1

Truth table of NOT Gate.

Input	Output
A	B
0	1
1	0

26. Differentiate CD and DVD.

CD	DVD
Expansion is Compact Disc	Expansion is Digital video disc/ Digital versatile disc
CD is made up of polycarbonate plastic material	DVD is an optical Disc
Storing capacity of ordinary CD is 700 MB	A 12 cm diameter disc with single sided, single layer has 4.7 GB capacity, whereas the single sided, double layer has 8.5 GB capacity

27. Write note on recycle bin.

Recycle bin is a special folder to keep the files or folders deleted by the user, which means you still have an opportunity to recover them. The user cannot access the files or folders available in the Recycle bin without restoring it.

28. What is decomposition?

Decomposition is one of the elementary problem-solving techniques. It involves breaking down a problem into smaller and more manageable problems, and combining the solutions of the smaller problems to solve the original problem.

29. Write short note on: (i) Keywords (ii) Identifiers

(i) Keyword:

Keywords are the reserved words which convey specific meaning to the C++ compiler. They are the essential elements to construct C++ programs. C++ is a case sensitive programming language so, all the keywords must be in lowercase.

(ii) Identifiers:

Identifiers are the user-defined names given to different parts of the C++ program viz. variables, functions, arrays, classes etc., These are the fundamental building blocks of a program. Every language has specific rules for naming the identifiers.

30. Write note on strcmp() functions in c++.

The strcmp() function takes two arguments: string1 and string2. It compares the contents of string1 and string2 lexicographically.

The strcmp() function returns:

• Positive value if the first differing character in string1 is greater than the corresponding character in string2. (ASCII values are compared)

• Negative value if the first differing character in string1 is less than the corresponding character in string2.

• 0 if string1 and string2 are equal

31. What is an array? What are its types?

An array is a collection of variables of the same type that are referenced by a common name. There are different types of arrays used in C++. They are:

• One-dimensional arrays • Two-dimensional arrays • Multi-dimensional arrays

32. Write about three types of visibility mode.

The three types of visibility mode are private, protected and public.

Private visibility mode: When a base class is inherited with private visibility mode the public and protected members of the base class become 'private' members of the derived class

Protected visibility mode: When a base class is inherited with protected visibility mode the protected and public members of the base class become 'protected members ' of the derived class

Public visibility mode: When a base class is inherited with public visibility mode , the protected members of the base class will be inherited as protected members of the derived class and the public members of the base class will be inherited as public members of the derived class

33. Read the following C++ code and answer the questions given below:

```
#include<iomanip>
#include<iostream>
using namespace std;
class product
{
        int code, quantity;
        float price;
        public:
        void assigndata();
        void print();
};
int main()
{
        product p1,p2;
        cout<<"\n Memory allocation for object p1"<<sizeof(p1);
        cout<<"\n Memory allocation for object p2"<<sizeof(p2);
      return 0;
}
```

(i) What is name of the class in the above program?

(ii) What are the data members of the class?

(iii) What is the memory size of the objects p1,p2?

Ans:

(i). product

(ii) code, quantity, price

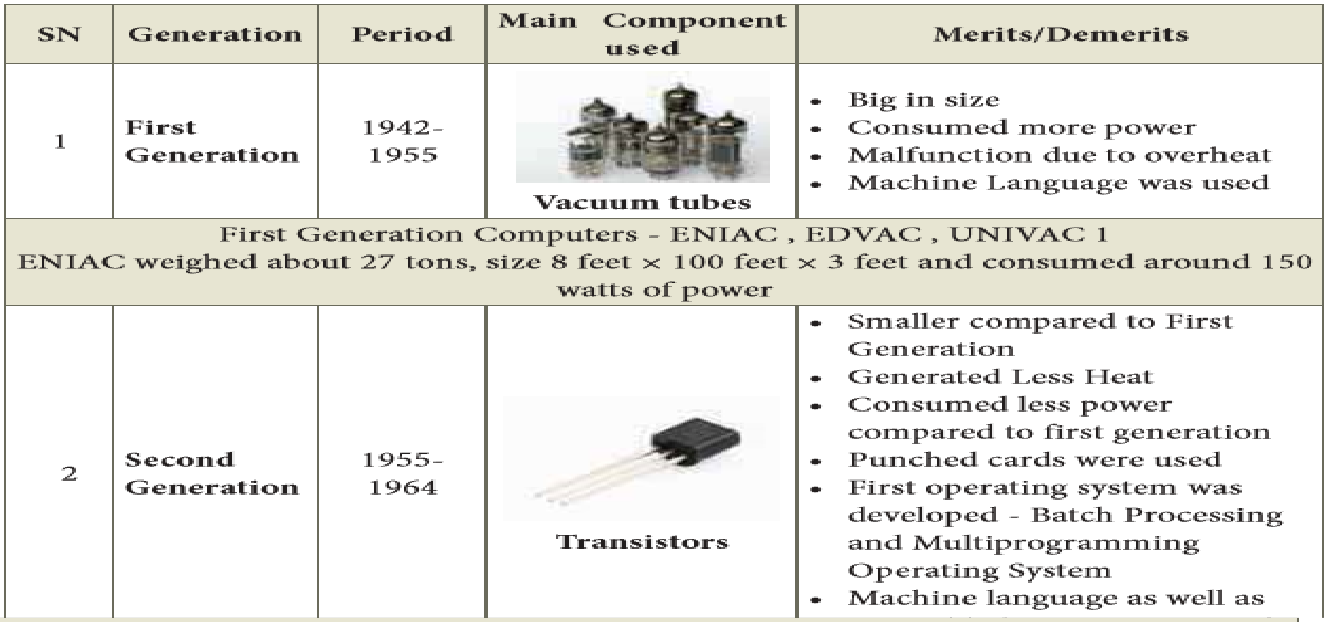
(iii) p1= 12

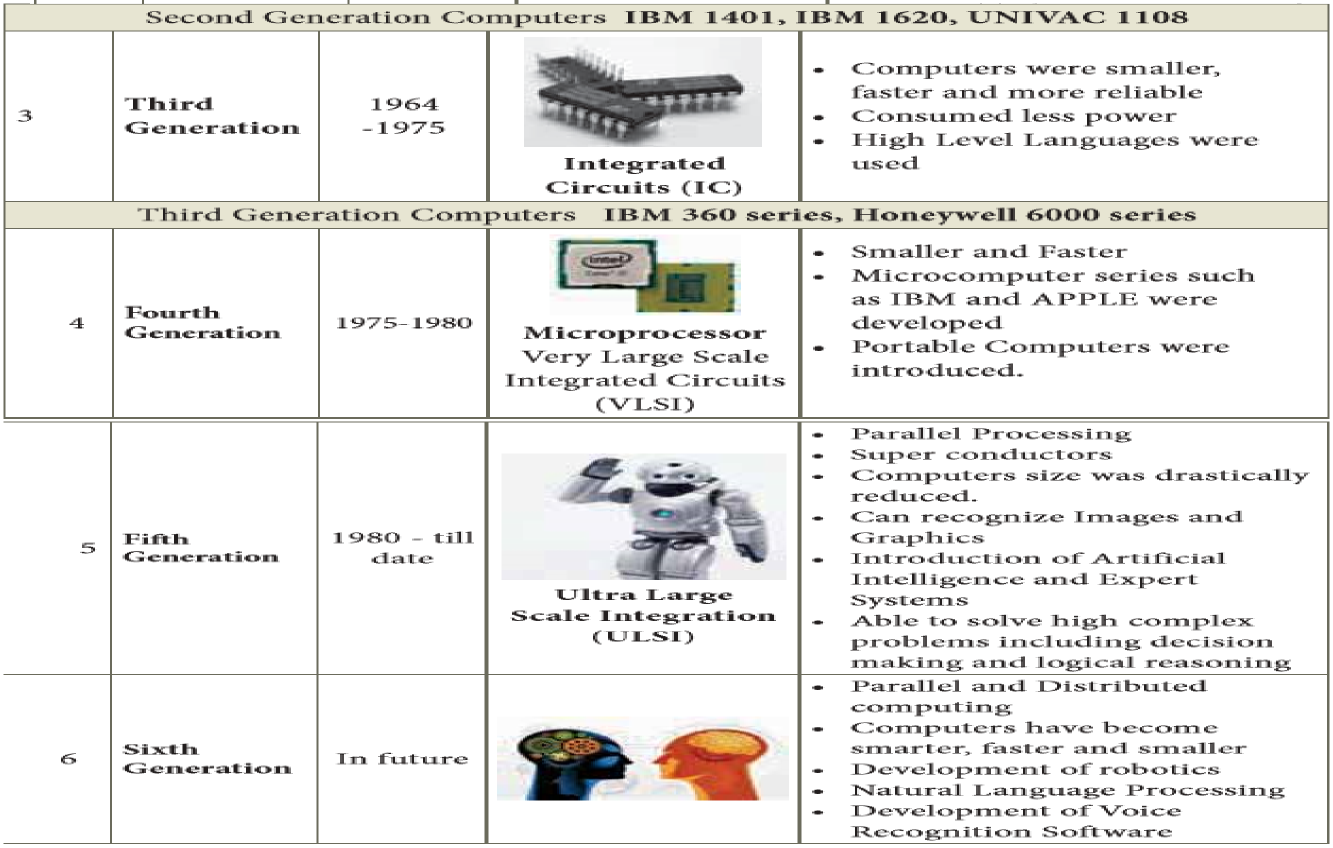
P2=12

PART-IV

34. (a) Discuss the various generations of computers.

Growth in the computer industry is determined by the development in technology. Based on various stages of development, computers can be categroized into different generations.





SN	Generation	Period	Main Component used	Merits/Demerits
1	First Generation	1942-1955	Vacuum tubes	• Big in size • Consumed more power • Malfunction due to overheat • Machine Language was used
First Generation Computers - ENIAC , EDVAC , UNIVAC 1 ENIAC weighed about 27 tons, size 8 feet × 100 feet × 3 feet and consumed around 150 watts of power				
2	Second Generation	1955-1964	Transistors	• Smaller compared to First Generation • Generated Less Heat • Consumed less power compared to first generation • Punched cards were used • First operating system was developed - Batch Processing and Multiprogramming Operating System • Machine language as well as
Second Generation Computers IBM 1401, IBM 1620, UNIVAC 1108				
3	Third Generation	1964 -1975	Integrated Circuits (IC)	• Computers were smaller, faster and more reliable • Consumed less power • High Level Languages were used
Third Generation Computers IBM 360 series, Honeywell 6000 series				
4	Fourth Generation	1975-1980	Microprocessor Very Large Scale Integrated Circuits (VLSI)	• Smaller and Faster • Microcomputer series such as IBM and APPLE were developed • Portable Computers were introduced.
5	Fifth Generation	1980 - till date	Ultra Large Scale Integration (ULSI)	• Parallel Processing • Super conductors • Computers size was drastically reduced. • Can recognize Images and Graphics • Introduction of Artificial Intelligence and Expert Systems • Able to solve high complex problems including decision making and logical reasoning
6	Sixth Generation	In future		• Parallel and Distributed computing • Computers have become smarter, faster and smaller • Development of robotics • Natural Language Processing • Development of Voice Recognition Software

b) Write the uses of operating system.

The main use of Operating System is

- To ensure that a computer can be used to extract what the user wants it do.
- Easy interaction between the users and computers.
- Starting computer operation automatically when power is turned on (Booting).
- Controlling Input and Output Devices
- Manage the utilization of main memory.
- Providing security to user programs

35.(a) Explain the types of errors in C++.

Type of Error	Description
Syntax Error	Syntax is a set of grammatical rules to construct a program. Every programming language has unique rules for constructing the sourcecode. • Syntax errors occur when grammatical rules of C++ are violated. • Example: if you type as follows, C++ will throw an error. cout << “Welcome to Programming in C++” • As per grammatical rules of C++, every executable statement should terminate with a semicolon. But, this statement does not end with a semicolon
Semantic Error	A Program has not produced expected result even though the program is grammatically correct.It may be happened by wrong use of variable / operator / order of execution etc. This means, program is grammatically correct, but it contains some logical error. So, Semantic error is also called as “Logic Error”.
Run-time error	A run time error occurs during the execution of a program. It is occurs because of some illegal operation that takes place. • For example, if a program tries to open a file which does not exist, it results in a run-time error

(b) What is entry controlled loop? Explain any one of the entry controlled loop with syntax and suitable example.

For loop and while loop are the entry control loop because the test expression is evaluated before the entering into a loop.

for loop

The for loop is the easiest looping statement which allows code to be executed repeatedly. It contains three different statements (initialization, condition or test-expression and update expression(s)) separated by semicolons

Syntax:

```
for (initialization(s); test-expression; update expression(s))
 {
Statement 1;
Statement 2;
…………
}
 Statement-x;
```

Example:

```
#include <iostream>
 using namespace std;
 int main ()
{
int i;
for(i = 0; i< 10; i ++ )
 cout<< "value of i : " <<i<<endl;
 return 0;
}
```

While loop

A while loop is a control flow statement that allows the loop statements to be executed as long as the condition is true. The while loop is an entry-controlled loop because the test expression is evaluated before the entering into a loop

Syntax:

```
while ( Test expression )
{
 Body of the loop;
}
Statement-x;
```

Example:

```
#include <iostream>
using namespace std;
int main ()
{
        int i=1,sum=0;
        while(i<=10)
        {
        sum=sum+i;
        i++;
         }
        cout<<"The sum of 1 to 10 is "<<sum;
        return 0;
}
```

Output:

```
The sum of 1 to 10 is 55
```

36. (a). What are the key differences between if..else and switch statements in C++? (any 5 points enough)

The if statement is more flexible than switch statement

1. Expression inside if statement decide whether to execute the statements inside if block or under else block. On the other hand, expression inside switch statement decide which case to execute.
2. An if-else statement uses multiple statements for multiple choices. On other hand, switch statement uses single expression for multiple choices.
3. If-esle statement checks for equality as well as for logical expression. On the other hand, switch checks only for equality.
4. The if statement evaluates integer, character, pointer or floating-point type or Boolean type. On the other hand, switch statement evaluates only character or a integer data type.
5. Sequence of execution is like either statement under if block will execute or statements under else block statement will execute. On the other hand the expression in switch statement decide which case to execute and if do not apply a break statement after each case it will execute till the end of switch statement.
6. If expression inside if turn out to be false, statement inside else block will be executed. If expression inside switch statement turn out to be false then default statements are executed.
7. It is difficult to edit if-else statements as it is tedious to trace where the correction is required. On the other hand, it is easy to edit switch statements as they are easy to trace.

(b) Explain scope rules of variables in C++ with example.

Scope refers to the accessibility of a variable. There are four types of scopes in C++. They are: Local scope, Function scope, File scope and Class scope.

A scope is a region or life of the variable and broadly speaking there are three places, where variables can be declared,

- Inside a block which is called local variables.

- Inside a function is called function variables.
- Outside of all functions which is called global variables.
- Inside a class is called class variable or data members.

Local Scope:

- A local variable is defined within a block.A block of code begins and ends with curly braces { }.
- The scope of a local variable is the block in which it is defined.
- A local variable cannot be accessed from outside the block of its declaration
- A local variable is created upon entry into its block and destroyed upon exit.

Example:

```
#include<iostream>
using namespace std;
int main ( )
{
        int a, b ;
        a = 10; b = 20;
        if (a > b)
        {
        int temp; //local to this if block//
        temp = a;
        a = b;
        b = temp;
        }
        cout <<"\n Descending order .... \n";
        cout <<a <<"\t"<<b;
        return(0);
}
```

Function Scope:

- The scope of variables declared within a function is extended to the function block, and all sub-blocks therein.
- The life time of a function scope variable, is the life time of the function block. The scope of formal parameters is function scope

Example:

```
#include<iostream>
using namespace std;
void add(int x, int y)
{
        int m=x+y; //'m' declared within function add()//
        cout<<"\nThe Sum = "<<m;
}
int main ( )
{
        int a, b ;
        a = 10;
        b = 20;
        add(a,b);
        return(0);
 }
```

File Scope

- A variable declared above all blocks and functions (including main ( )) has the scope of a file. The life time of a file scope variable is the life time of a program.
- The file scope variable is also called as global variable.

Example:

```
#include<iostream>
using namespace std;
int file_var=20; //Declared within File//
void add(int x, int y)
{
        int m=x+y+file_var;
        cout<<"\n The Sum = "<<m;
}
int main ( )
{
        int a, b ;
        a = 10; b = 20;
        add(a,b);
        cout<<”\nThe File Variable = “<<file_var;
        return(0);

  }
```

Class Scope

- A class is a new way of creating and implementing a user defined data type. Classes provide a method for packing together data of different types.
- Data members are the data variables that represent the features or properties of a class.

Example:

class student
{
private : int mark1, mark2, total;
};
	The class student contains mark1, mark2 and total are data variables. Its scope is within the class student only

37. (a)(i) What is structure? What is its use?

(ii) Write the syntax and an example for creating a structure.

(iii) How to access members of a structure? Give example.

(i). Structure: Structure is a user-defined which has the combination of data items with different data types.

Uses: • Structure allows to group of variables of mixed data types together into a single unit.

- The structure provides a facility to store different data types as a part of the same logical element in one memory chunk adjacent to each other.

(ii) Syntax:

```
struct structure_name
{
 type member_name1;
 type member_name2;
} reference_name;
```

Example:

```
struct Student
{
 long rollno;
 int age;
 float weight;
} ;
```

(iii) Once object is declared their members can be accessed directly.

The syntax for that is using a dot (.) between the object name and the member name

For example:

```
struct Student
{
long rollno;
int age;
float weight;
}balu, frank;
```

Here balu and frank are the object of structure Student and their member’s rollno, age, weight can be accessed as

```
balu.rollno
balu.age
balu.weight
frank.rollno
frank.age
frank.weight
```

(b) Write the output for the following C++ program. Assume the values for age as 23, height as 161.5 and weight as 45.

```
#include<iostream>
using namespace std;
struct Student
{
        int age;
        float height,weight;
}obj;
int main()
{
        cout<<”\n Enter the age :”;
        cin>>obj.age;
        cout<<”\n Enter the height :”;
        cin>>obj.height;
        cout<<”\n Enter the weight:”;
        cin>>obj.weight;
        cout<<”\n Your details:”;
        cout<<”\n Age :” <<obj.age;
        cout<<”\n Height :”<<obj.height;
        cout<<\t weight :”<<obj.weight;
        return 0;
}
```

Output:

```
Enter the age: 23
Enter the height: 161.5
Enter the weight: 45
Your details
Age: 23
Height: 161.5
        weight: 45
```

38. (a) (i) Explain the main features of OOPS

•Data Abstraction • Encapsulation • Modularity • Inheritance • Polymorphism

Data Abstraction

Abstraction refers to showing only the essential features without revealing background details. Classes use the concept of abstraction to define a list of abstract attributes and function which operate on these attributes.

Encapsulation:

The mechanism by which the data and functions are bound together into a single unit is known as Encapsulation

Modularity

Modularity is designing a system that is divided into a set of functional units (named modules) that can be composed into a larger application

Inheritance

Inheritance is the technique of building new classes (derived class) from an existing Class (base class). The most important advantage of inheritance is code reusability.

Polymorphism

Polymorphism is the ability of a message or function to be displayed in more than one form.

(ii) What are the advantages of OOPS

Re-usability:

“Write once and use it multiple times” you can achieve this by using class.

Redundancy:

Inheritance is the good feature for data redundancy. If you need a same functionality in multiple class you can write a common class for the same functionality and inherit that class to sub class

Easy Maintenance:

It is easy to maintain and modify existing code as new objects can be created with small differences to existing ones.

Security:

Using data hiding and abstraction only necessary data will be provided thus maintains the security of data.

(b) Debug the given C++ program to get the following output:

Output:

```
Sum constructor:
Difference Constructor:
1.Add:

2. Difference:
```

```
Enter the values for a and b: 20  60
The difference of two numbers are :40
Difference Destructor:
Sum Destructor:
```

Program

```
?include<iostream>
using namespace std
class sum
{
    int a,s;
    protected:
        int b;
    publicly:
        void sum()
        {
            a=b=s=0;
            cout<<”\n Sum Constructor :”;
        }
        void input();
        {
            cout<<”\nEnter the values for a and b :”;
            cin>>a>>b;
        }
        void addition()
        {
            s=a+b;
            cout<<”\n The sum of two numbers is :”<<s;
        }
        void minus()
        {
            return a-b;
        }
        +sum()
        {
            cout<<”\n Sum destructor :”;
        }
};
class difference #public sum
{
    int d1;
    public:
        difference()
        {
            d=0;
            cout<<”\n Difference constructor:”;
        }
        void sub()
        {
            input();
            d=minuses();
            cout<<”\n The difference of two numbers are: “<<d;
        }
        ~difference()
        {
            cout<<”\n Difference Destructors :”;
        }
};
int main[]
{
    difference obj;
    int ch=0;
    cout<<”\n 1.Add :\n\n 2. Difference :”;
    cout<<”\n\n Enter your choice :”;
    cin>>ch;
    switch(ch);
    {
        case ‘1’:
            obj.input();
            obj.addition();
            break;
        case ‘2’:
            obj.sub();
            break;
    }
};
```

Answer: correct program

```
#include<iostream>
using namespace std;
class sum
{
    int a,s;
    protected:
        int b;
    public:
        sum()
        {
            a=b=s=0;
            cout<<”\n Sum Constructor :”;
        }
        void input()
        {
            cout<<”\nEnter the values for a and b :”;
            cin>>a>>b;
        }
        void addition()
        {
            s=a+b;
            cout<<”\n The sum of two numbers is :”<<s;
        }
        int minus()
        {
            return a-b;
        }
        ~sum()
        {
            cout<<”\n Sum destructor :”;
        }
};
class difference : public sum
{
    int d1;
    public:
        difference()
        {
            d1=0;
            cout<<”\n Difference constructor:”;
        }
        void sub()
        {
            input();
            d1=minus();
            cout<<”\n The difference of two numbers are: “<<d1;
        }
        ~difference()
        {
            cout<<”\n Difference Destructors :”;
        }
```

```
};
int main()
{
        difference obj;
        int ch=0;
        cout<<”\n 1.Add :\n\n 2. Difference :”;
        cout<<”\n\n Enter your choice :”;
        cin>>ch;
        switch(ch)
        {
                case 1:
                        obj.input();
                        obj.addition();
                        break;
                case 2:
                        obj.sub();
                        break;
        }
}
```

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