LECTURE NO. 1

PREVIEW OF TODAY'S TOPICS

☞ **Control Structure & Types of Control Structure , IF Statement**

LOOPS

LONG QUESTIONS

1. Write a program to print odd number from 1 to 10 using while loop. **(LHR 2021)**

2. Define while loop? Write its syntax and flow chart. Also explain it working with the help of an example. **(BWP 2022)(LHR 2017, 18)**

3. Write a program that get starting and ending numbers then print counting in between these numbers using while loop. **(MTN 2021)**

4. Define while loop and differentiate while and do – while loop in detail. **(RWP 2019)**

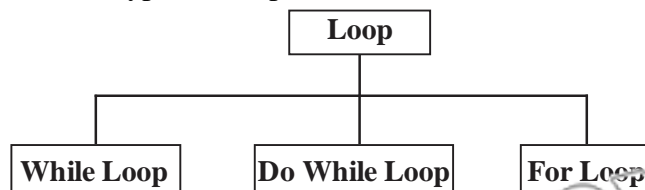5. Write a program that input a number & print its table by using loop. **(FSD 2021)**

SHORT QUESTIONS

1. Define while loop. **(LHR 2022) (FSD 2022) (SWL 2019)(K.B)**

2. What is loop? **(K.B)**

3. What is syntax of while loop? **(U.B)**

4. Write a program to display first ten natural numbers by using while loop.
   (LHR 2021)(A.B)

5. Convert the following for loop into while loop. **(GRW 2022)(A.B)**

        int m;
        for (m =10; m <5 ; m - -)
        printf("%d \n" ,m);

LOOP:

The repeatedly execution of a statement or set of statements is called a loop. In loop the statement or a set of statements execute for a fixed number of times or until the condition remains true. The statement or set of statements that are executed repeatedly is called body of the loop. Looping structure is also called iterative or repetitive structure. In C language there are three types of loops statement.

```
               ┌──────────┐
               │   Loop   │
               └──────────┘
        ┌───────────┼───────────┐
┌────────────┐ ┌──────────────┐ ┌──────────┐
│ While Loop │ │ Do While Loop│ │ For Loop │
└────────────┘ └──────────────┘ └──────────┘
```
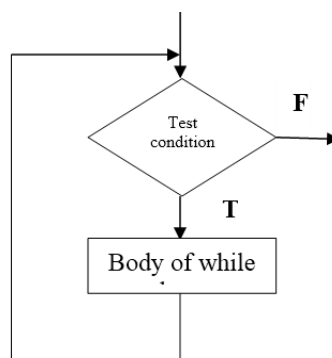
• **While Loop**

It is a conditional loop statement, it executes a statement or a set statements repeatedly until the given condition remains true.

Syntax:

The syntax of while statement is

        while (condition)
        {
            statement(s);
        }

The condition in the while loop controls the loop iterations. If the condition is true the statements in the body of the loop is executed. As soon as the condition becomes false the loop is terminated.

Example#1

Write a program to display first ten natural numbers.

```c
#include <stdio.h>
void main()
{
    int n;
    n=1;
    while(n<=10)
    {
        printf("%d \n", n);
        n++;
    }
}
```

MULTIPLE CHOICE QUESTIONS

Q.No.1

1. **The set of statement in curly braces in a loop is known as ---- of the loop:** (LHR 2022)
   (a) Title   (b) Header
   (c) Center   **(d) Body**

2. **Which is not a loop construct?** (GRW 2022)
   (a) while   (b) do while
   (c) for   **(d) if**

3. **While loop is also called:** (FSD 2019) (SGD 2019)
   (a) Conditional loop   (b) Wend loop
   (c) Counter loop   (d) Continuous loop

4. **One execution of a loop is known as a (n)** (FSD 2022)(DGK 2022)
   (a) Cycle   (b) Duration
   (c) Iteration   (d) Test

5. **How many types of loop structure are available in C- language:** (BWP 2022)
   (a) 3   (b) 6
   (c) 9   (d) 12

6. **Which keyword is used for loop?** (RWP 2022)
   (a) While   (b) nested
   (c) loop   (d) if

7. **Repetition of statement up to fixed number of times or certain condition is satisfied is called:**
   (a) Array   (b) Label   (c) String   **(d) Loop**

8. **In which loop the body of the loop may or may not execute depending on condition?**
   (a) While loop   (b) do-while loop   (c) For loop   (d) All of these

SHORT QUESTIONS

Q.No.2

What is loop? (K.B)

Ans: LOOP:

The structure that would allow repeating a statement or set of statements up to fixed number of times of until a certain condition is satisfied is called loop.

There are three types of loops

1- while
2- do-while
3- for

Q.2   Define while loop. (LHR 2022) (FSD 2022) (SWL 2019)(K.B)

Ans: WHILE STATEMENT:

The while loop is used to execute one or more statements until the given condition becomes false. This loop is useful where the programmer does not know the number of iteration in advance.

Syntax

The syntax of while statement is

```
while(condition)
{
        statement(s);
}
```

Q.3 What is syntax of while loop?   **(U.B)**

Ans: The syntax of while statement is

```
while(condition)
{
        statement(s);
}
```

The condition in the while loop controls the loop iterations. If the condition is true the statements in the body of the loop is executed. As soon as the condition becomes false the loop is terminated.

Q.4 Write a program to display first ten natural numbers by using while loop.

(LHR 2021)(A.B)

Ans:
```
#include <stdio.h>
void main()
{
        in n;
        n=1;
        while(n<=10)
        {
                printf("%d \n", n);
                n++;
        }
}
```

Q.5 Convert the following for loop into while loop

(GRW 2022) (DGK 2022) (BWP 2022) (FSD 2022) (A.B)

```
int m;
for (m =10; m <5 ; m - -)
printf( "%d \n" ,m);
```
Ans:
```
int m = 10;
While (m < 5)
{
printf( "%d \n" ,m);
m--;
}
```

2nd YEAR COMPUTER

REVISION LECTURE NOTES
CHAPTER NO.12
(LOOP CONSTRUCTS)

LECTURE NO.2   **[TIME: 30 MIN.]**

TOPICS OF THE DAY	
A. do while loop	Name: _____ Roll No: _____ Date: _____

DO-WHILE LOOP

EXTENSIVE QUESTION

Q.1   **Define while loop and differentiate while and do – while loop in detail.**   **(RWP 2019)**

Q.2   **What is do-while loop? Explain its working with example.**   **(GRW 2018, 22) (RWP 2022)**

Q.3   **Write a program that print first ten odd numbers by using do-while loop.** **(SWL 2021)(BWP 2021)**

SHORT QUESTIONS

(i)   **What is do while loop?**   **(SGD 2019, 21)(K.B)**

(ii)   **Write the syntax of do-while loop?**   **(U.B)**

(iii)   **Write a program that print first ten odd numbers by using do-while loop.** **(BWP 2021) (A.B)**

(iv)   **Convert the given program in do-while loop.**

(LHR 2022) (MTN 2022) (BWP 2022) (U.B)

```
int I;
for (I = 3; I < =39; i + = 6 );
printf ("%d\n", i);
```
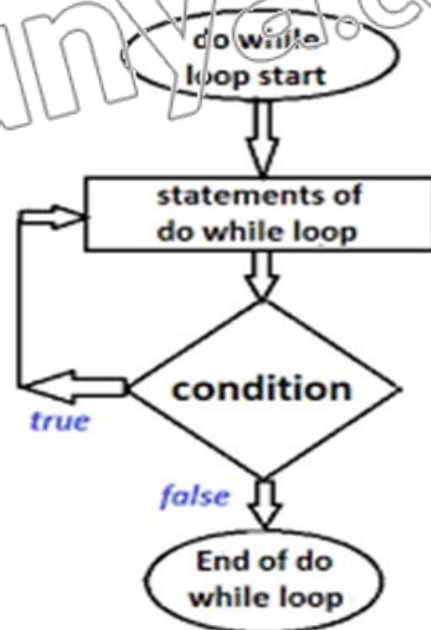
do-while loop

It is a loop statement that is used to execute a statement or set of statements as long as the given condition remains true. Its working is similar to while loop but condition comes after the body of the loop, so, one body of the loop must be executed at learn once even if the condition is false.

The general syntax of do while loop is

```
do {
        Statement 1;
        Statement 2;
        Statement 3;
            .
            .
            .
        Statement n;
} while (condition);
```

next statements

Do:

It is a key word of C language it indicates the beginning of the loop body.

Statement:

These are the statements that are executed repeatedly until the condition remains true.

Condition:

It should be a logical or relational expression that will generate true or false after evaluation.

The keyword do let the program flow to move into the body of the loop without checking any test condition. It means, whatever is written in the loop body always will be executed

at least once. At the completion of execution of the body of the loop, the test condition is checked. If it is found true, the control is transferred to the first statement in the body of the loop, and if the condition is evaluated to false, the loop terminates immediately and the control moves to the very next instruction outside the loop.

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i) **Semi Colon is placed at the end of condition in:** (BWP 2019)
(a) While Loop (b) Do – While – Loop
(c) For – Loop (d) Wend -- Loop

(ii) **In which of the following loop, condition comes after the body of loop.** (SWL 2022)
(a) for **(b) do-while**
(c) while (d) while -end

(iii) **Which of the following loop executed at least once?** (SGD 2018) (FSD 2019)
(a) do – while (b) while
(c) for (d) All of above

(iv) **What will be the output of the following program code?**
int $a = 10$;
do {
printf("%d",a +=5),
}while(a<=12);
(a) 15 (b) 16
(c) 12 (d) Error

SHORT QUESTIONS

Q.No.2

Q.1 **What is do while loop?** (SGD 2019, 21) (K.B)
Ans: **do while loop:**
The do-while loop is also used to execute one or more statements until the given condition becomes false. The do-while loop is similar to while loop except that the condition occurs at the end of the loop body, so the body of the loop must be executed at least once even if the condition is the false.
Syntax:
The syntax of do while loop is
```
        do{
                statement(s);
        }while(condition);
```

Q.2 **Write the syntax of do-while loop?** (U.B)
Ans: The syntax of do while loop is
```
        do{
                statement(s);
        }while(condition);
```
The important point in the do-while loop is that it ends with a semicolon. Omitting the

Q.3 **Write a program that print first ten odd numbers by using do-while loop.** (BWP 2021) (A.B)
Ans: include <stdio.h>
```
#include <conio.h>
void main()
{
        in n;
        n=1;
        do{
                printf("%d \n", n);
                n+=2;
        }while(n<=20);
        getch();
}
```

Q.4 **Convert the given program in do-while loop.**

```
int I;
for (I = 3; I < =39; I + = 6 );
printf ("%d\n", i);
```

Ans:

```
int I = 3;
do
{
        printf ("%d\n", I);
        I += 6;
} while (I<=39);
```

2nd YEAR COMPUTER

REVISION LECTURE NOTES
CHAPTER NO.12
(LOOP CONSTRUCTS)

LECTURE NO. 3   **TIME: 30 MIN.**

PREVIEW OF TODAY'S TOPICS

B.   For loop

THE FOR STATEMENT
EXTENSIVE QUESTION

Q.1   **Define for loop. Write its syntax and flow chart. Explain its working with example.**
          (LHR 2022) (MTN 2022) (DGK 2022) (FSD 2022) (SGD 2018) (GRW 2017)

Q.2   **Write a program that displays counting from 10 to 1 using for loop.**   **(GRW 2019)**

Q.3   **Write a program that inputs a number from the user and displays the factorial of that number using while or for loop structure.**   **(DGK 2021)**

SHORT QUESTIONS

(i)   **What is for statement?**   **(K.B)**

(ii)   **What is the syntax of for statement?**   **(GRW 2019)(U.B)**

(iii)   **What is the role of test condition in for statement?**   **(U.B)**

(iv)   **Write a program to print digits from 1 to 10 by using for loop statement.**   **(A.B)**

(v)   **Write a note on counter control loop.**   **(SGD 2018)(U.B)**

(vi)   **Convert following while loop into for loop?**   **(SGD 2019, 21) (SWL 2022) (U.B)**

```
int c = 0;
while (c<5)
{
printf("%d\n", c);
c ++;
}
```
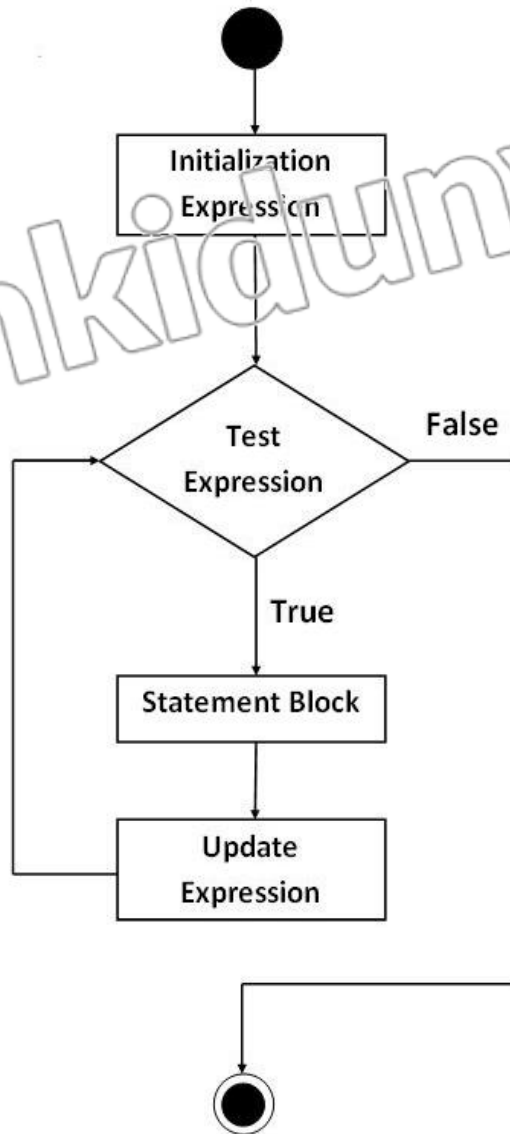
Def:

"for" is a keyword of C language "for" statement is used as a loop statement. It is used to execute a statement or a set of statement repeatedly for a specific number of times. It is also called counter loop.

Syntax:

The syntax of the for loop is a follow.

for (initialization expression; test condition; increment/decrement expression)

```
{
    statement(s);
}
```

- **Initialization:**
  In this part a variable is given a value. The initialization expression is executed in only the first iteration. Then the loop condition is tested.
- **Condition:**
  It should be a relational expression that generate true or false after evaluation.
- **Increment / decrement:**
  In this portion the value of variable is increased or decreased. If more than one variable are used these variables should be separated by comma.
- **Statement:**
  These are the C language statements that executes repeatedly.
  The three parts of loop are separated by semicolon.

Example#1

Write a program to print digits from 1 to 10 by using for loop statement.

```
#include <stdio.h>
#include <conio.h>
void main()
{
        int n;
        for(n=1; n<=10; n++)
            printf(" %d \n ", n);
        getch();
}
```

MULTIPLE CHOICE QUESTIONS

Q.No.1

(i)   **No, of expressions in for loop statement are;**   (SDG 2021)

(a) 3   (b) 4

(c) 5   (d) 6

(ii) **In a for statement, this expression is executed only once:**   (GRW 2021) (SWL 2019)

(a) Test   **(b)** Validation

(c) Initialization   (d) None of these

(iii) **When the number of iterations of execution are known which is the best choice of programmer?**

(a) For Loop   (b) Do – while loop

(c) While loop   (d) None of these

(iv) **The for loop expressions are enclosed in:**

(a) ( )   (b) { }

(c) [ ]   (d) None of these

(v) **What is the final value of X after executing the following code?**

for(int x = 0; x< 10; x++)

(a) 10   **(b)** 9   **(c)** 0   **(d)** 1

SHORT QUESTIONS

Q.No.2

Q.1 **What is for statement?**   (K.B)

Ans: **For Statement:**

The for loop execute a statement or set of statements up to a fixed number of times. It's usually used when programmer know how many time the loop is executed.

Syntax:

The syntax of the for loop is as follows

```
for(initialization expression; test condition; increment/decrement expression)
{
    statement(s);
}
```

Q.2 **What is the syntax of for statement?**   (GRW 2019)(U.B)

Ans: <u>**Syntax:**</u>

The syntax of the for loop is as follows

```
for(initialization expression: test condition, increment/decrement expression)
{
    statement(s);
}
```

There are three expression in the for loop statement these are

- Initialization of the loop control variable
- Test condition
- Increment/decrement of the loop control variable.

Q.3 **What is the role of test condition in for statement?**   (U.B)

Ans: **Test condition:** The test condition usually involves a relational operation. It is evaluated each time through the loop. Just before the body of loop is executed, it determines whether the loop will be executed again. If it is true the statement in the body of the loop are executed. If it is false, the loop ends and control transfers to the statements followings the for loop.

Q.4 **Write a program to print digits from 1 to 10 by using for loop statement.**   (A.B)

Ans:
```
#include <stdio.h>
#include <conio.h>
void main()
```

```
        {
                in n;
                for(n=1; n<=10; n++)
                    printf(" %d \n ", n);
                getch();                  }
```

Q.5   Write a note on counter control loop.   **(SGD 2018)(U.B)**

Ans: Counter controlled loop is the loop that depends on counter variable. When the value of counter variable reaches to its last value, the loop terminates. The for loop is an example of counter controlled loop.

Q.6   Convert following while loop into for loop?   **(SGD 2019, 21) (SWL 2022) (U.B)**

int c = 0;
while (c<5)
{
printf("%d\n", c);
c ++;
}

2nd YEAR COMPUTER

REVISION LECTURE NOTES
CHAPTER NO.12
(LOOP CONSTRUCTS)

LECTURE NO.4   **TIME: 30 MIN.**

PREVIEW OF TODAY'S TOPICS

C.   Nested loop

NESTED LOOP

EXTENSIVE QUESTION

Q.1   What is nested loop? Write its syntax and explain its working with flowchart and

example.   (SWL 2022)

SHORT QUESTIONS

(i)   **What is nested loop?**   (LHR 2021) (SWL 2019) (RWP 2019)(U.B)

(ii)   **What is loop control variable and give example?**   (U.B)

nested loop:

     Def

     "A loop inside the body of another loop is called nested loop".

Nesting can be done up to any level but as the level of nesting increases the complexity of the nested loop also increases. There is no restriction on the type of loops that may be placed inside the body of other loops. For example, while loop can be placed in the body of for loop or the do-while loop can be placed inside the while loop etc.

     Syntax:

     Outer loop

     {

         inner loop

         {

             statements

         }

     statements

     }

Program:

```
#include <stdio.h>
#include<conio.h>
void main()
{

        int a,b;
        clrscr();

        for(a=1; a<=5; a++)
        {
          for(b=1; b<=a; b++)
             printf("*");
          printf("\n");
        }
    getch();
}
```

     Output:

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

MULTIPLE CHOICE QUESTIONS

Q.No.1

(1)   **A loop inside another loop is called:** (DGK 2021) (SWL 2021) (FSD 2019) (SGD 2019)(LHR 2018)

     (a) Nested if   (b) Switch statement

     (c) Nested loop   (d) Sequence structure

(2)   **A variable whose value controls the number of iterations is known as.**

     (a) Global variable   (b) Identifier

     (c) Local variable   **(d) Loop control variable**

SHORT QUESTIONS

Q.No.2

Q.1   **What is nested loop?**   (LHR 2021) (SWL 2019) (RWP 2019)

Ans: **Nested Loop:**

A loop inside the body of another loop is called nested loop. Nesting can be done up to any level but as the level of nesting increases the complexity of the nested loop also increases. There is no restriction on the type of loops that may be placed inside the body of other loops. For example, while loop can be placed in the body of for loop or the do-while loop can be placed inside the while loop etc.

Q.2   **What is loop control variable and give example?**   **(U.B)**

Ans: **loop control variable**

A variable whose value controls the number of iterations is known as loop control variable.

Example#1

```
#include<stdio.h>
void main()
{
int n;
for(n=1; n<=5; n++)
printf("PAKISTAN \n");
}
```

In the above example n is called loop control variable

REVISION LECTURE NOTES
CHAPTER NO.12
(LOOP CONSTRUCTS)

LECTURE NO.5   **TIME: 30 MIN.**

PREVIEW OF TODAY'S TOPICS

D.   Sentinel-controlled loop, Goto statement

SENTINEL CONTROLLED LOOP, GOTO STATEMENT

EXTENSIVE QUESTION

Q.1   **Describe the sentinel controlled loop with an example**

SHORT QUESTIONS

(i)	**Why is sentinel value used in loops?**	**(LHR 2021)(U.B)**
(ii)	**Define sentinel loop.**	**(MTN 2022)(BWP 2022)(K.B)**
(iii)	**What is sentinel value?**	**(DGK 2022)(K.B)**
(iv)	**State the use of goto statement**	**(LHR 2018)(U.B)**
Or	**define goto statement.**	**(FSD 2022)(K.B)**

SENTINEL CONTROL LOOP:

The value which terminate the loop execution is called sentinel value and the loop that terminates depends on the sentinel value is called sentinel controlled loop. A sentinel value is usually used with while and do-while loops.

The general form of sentinel controlled loop is as follow

1.   Get the first line of data
2.   While the sentinel value has not been encountered
3.   Process the data line
4.   Get another line of data

The sentinel controlled loop can be used in the following situations.

There are many situations where the solution demands to enter a list to items to process. But often we do not know how many data items will be input by the user For example.

To find the average marks of a class, we have to input the marks of every student of the class

To calculate the sum of series, we have to input the list of numbers in the series.

Example:

Write a program to find the average marks of the students in a class.

```c
#include<stdio.h>
#include<conio.h>
void main(void)
{
    int sum =0, marks, total_students =0;
    float average;
    clrscr();
    do{
        printf("Enter marks of the student (or any press -ve number to quit) >");
        scanf("%d" ,&marks);
        if (marks >= 0)
        {
            total_student++;
            sum += marks;
        }
    } while(marks >=0);
    if (total_student > 0)
    {
        average =sum / (float)total_students;
        printf("The average marks of the class are: %f \n ",average);
    }
    else
```

printf("Please enter the marks of at least one student to calculate average \n");
}

This program demonstrates a typical implementation of sentinel loop. Size of the class does not matter, whatever it is the average will be calculated in the same way. Here any negative number may act as the sentinel value because no student can have negative marks.

GOTO STAEMENT

The goto statement performs an unconditional transfer of control to a named label. The labeled must be in the same function. A label is meaningful only to a goto statement.

Syntax:

The syntax of goto statement is as follows

    goto label;

    ....

    label: statement;

MULTIPLE CHOICE QUESTIONS

Q.No.1

(1) **Which of the following operator is used after label in goto statement?** (MTN 2022)

(A) Comma   **(B) Colon**

(C) Sami colon   (D) dot

(2) **In order to stop the execution of loop User enter a unique value which is called:**

(a) Control value   (b) stop value

(c) Sentinel value   (d) Sequence value

(3) **Which of the following is the end marker that follows the last item in a list of items?**

(a) Control value   (b) stop value

(c) Sentinel value   (d) Sequence value

(4) **A label is meaningful only to which statement?**

(a) gotoxy   **(b) goto**

(c) clrscr   **(d)** function

SHORT QUESTIONS

Q.No.2

Q.1 **What is sentinel control loop?** (SWL 2022) (MTN 2022) (DGK 2022) (BWP 2022) (LHR 2021)(K.B)

The value which terminate the loop execution is called sentinel value and the loop that terminates depends on the sentinel value is called sentinel controlled loop. A sentinel value is usually used with while and do-while loops.

Q.2 **What is loop control variable and give example?** (K.B)

A variable whose value controls the number of iterations is known as loop control variable.

Example#1

Write a program that print PAKISTAN five times.

```
#include<stdio.h>
void main()
{
    int n;
    for(n=1; n<=5; n++)
    printf("PAKISTAN \n");
}
```

In the above example n is called loop control variable

Q.3 **Write down the general form of sentinel controlled loop.** (U.B)

The general form of sentinel controlled loop is as follow

1.   Get the first line of data
2.   While the sentinel value has not been encountered
3.   Process the data line
4.   Get another line of data

Q.4 **What is the purpose goto statement?** (FSD 2022)(LHR 2018)(U.B)

Ans: **GOTO STAEMENT**

The goto statement performs an unconditional transfer of control to a named label. The labeled must be in the same function. A label is meaningful only to a goto statement.

The syntax of goto statement is as follows

goto label;

.... label: statement;

STUDENTS LEARNING OBJECTIVES (SLOs)

MULTIPLE CHOICE QUESTIONS

Knowledge Based Questions

(i) Repetition of statement up to fixed number of times or certain condition is satisfied is called.

(a) Array
(b) Label
(c) String
(d) Loop

(ii) In which of the following loop condition comes before body of the loop?

(a) do – while
(b) for
(c) while
(d) Nested loop

(iii) Which of the following loop executed at least once?

(a) do – while
(b) while
(c) for
(d) All of above

(iv) When the number of iterations of execution are known which is the best choice of programmer?

(a) for
(b) do – while
(c) while
(d) None of these

(v) Which of the following is an example of unconditional transfer of control statement?

(a) goto
(b) If
(c) Switch
(d) All of above

Understanding Based Questions

(i) Which are the mandatory part of for loop.

(a) Loop control variable initialization
(b) Condition
(c) Increment
(d) Decrement

(ii) Which of the following expression is executed only once in the for loop?

(a) Condition loop control
(b) Increment/Decrement
(c) Initialization
(d) None of these

(iii) A label is meaningful only to a which statement?

(a) gotoxy
(b) goto
(c) clrscr
(d) function

(iv) Which statement is used to move the control to the start of loop body:

(a) Continue
(b) Break
(c) Switch
(d) None of these

(v) Semicolon is placed at the end of condition in:

(a) for loop
(b) while loop
(c) do---while loop
(d) Nested loop

Application Based Questions

(i) What will be the output of the following program code?

```
int a=10;
do
printf("%d",a += 5);
} while(a<=12);
```

(a) 22
(b) 15
(c) 12
(d) Error

(ii) What is the final printed value of X after executing the following code?

```
for (int x = 0; x< 10; x++)
```

(a) 10
(b) 9
(c) 0
(d) 1

(iii) A loop that never ends is called:

(a) Infinite loop
(b) Finite loop
(c) Nested loop
(d) Running loop

(iv) If you want a user to enter exactly 20 values, which loop would be the best to use?

(a) while
(b) do – While
(c) Infinite
(d) for

(v)   **The expressions in the for loop is separated by:**

(a) ,   **(b) ;**

(c) | (d) .

SHORT QUESTIONS

Knowledge Based Questions

Q.1   What is loop?

Ans: LOOP

The structure that would allow repeating a statement or set of statements up to fixed number of times or until a certain condition is satisfied is called loop.

There are three types of loops

   i.   while

   ii.   do-while

   iii.   for

Q.2   What is syntax of while loop?

Ans: The syntax of while statement is

  while (condition)

  {

  Statement;

  }

The condition in the while loop controls the loop iterations. If the condition is true the statements in the body of the loop is executed. As soon as the condition becomes false the loop is terminated.

Q.3   What is the syntax of for statement?

Ans: For (initialization expression; test condition; increment/decrement expression)

     {

     Statement;

     }

There are three expressions in the for loop statement these are

- **Initialization of the loop control variable**
- **Test condition**
- **Increment/decrement of the loop control variable.**

Q.4   What is sentinel control loop?

Ans:

The value which terminate the loop execution is called sentinel value and the loop that terminates depends on the sentinel value is called sentinel controlled loop. A sentinel value is usually used with while and do-while loops.

Q.5   What is counter controlled loop?

Ans: counter controlled loop is the loop that depends on counter variable. When the value of counter variable reaches to its last value, the loop terminates. The for loop is an example of counter controlled loop.

Understanding Based Questions

Q.1   How test condition works in for loop statement?

Ans:

The test condition usually involves a relational operation. It is evaluated each time through the loop. Just before the body of loop is executed. It determines whether the loop will be executed again. If it is true, the statement in the body of the loop are executed. If it is false, the loop ends and control transfers to the statements followings the for loop.

Q.2   How goto statement works? OR write a note on unconditional transfer of control.

Ans:

The goto statement performs an unconditional transfer of control to a named label. The labeled must be in the same function. A label is meaningful only to a goto statement.

The syntax of goto statement is as follows

goto label;

....

label: statement;

Q.3   Trace output

```
for(i=3; i<=39; i+=6)
  printf("%d \n", i);
```

Ans: Output

```
3    27
9     33
15   39
21
```

Q.4 What is the output of the following code?

```
int x = 0, i;
for(i=0; i< 3; i++)
  x + = 1;
printf(" %d \n", x);
```

Ans:

Output

```
3
```

Q.5 Write the output of the following code?

```
int  num =  3;
do{
  num *= 2;
 }while(num <48);
printf("%d \n", num);
```

Ans:

Output

```
48
```

Application Based Questions

Q.1 Write a program that displays first ten even numbers.

Ans:

```
#include <stdio.h>
void main()
{
int n;
n=2;
while(n<=20)
{
printf("%d \n", n);
n+=2;
}
```

Q.2 Convert the following loop in do while loop.

```
For (1=3;i<=39;i+=6
  {
  Printf ("%od\n" i);
  }
```

Ans:

Output

= 3,9,15,21,27,33,39

Q.3 Write a program that print first ten odd numbers by using do-while loop.

Ans:

```
#include <stdio.h>
void main()
{
int n;
n=1;
do{
printf("%d \n", n);
n+=2;
}while(n<=20);
}
}
```

Q.4   **Trace the error form the following program.**

```
main()
{
  int K<=15;
  while (K<10)
  {
    printf("%d", K);
    K++;
  }
}
```

Ans:

Output

int K<=15;   (Declaration syntax error)

Q.5   **Trace error in the following code:**

```
Void main ( )
{
int x, u = 5;
for (x = 0; x < 3: x + + )
If (y > = 5)
Print f (" % d" , x);
}
```

Ans:

```
void main ( )
{
int x, u = 5;
for (x = 0; x < 3: x + +)
if (x > = 5)
printf(" % d" , x);
}
```