

```

while( num > 0 )
{
    temp = num % 10;
    sum += temp * temp * temp;
    num = num / 10;
}

if( sum == original )
    printf("\n%d is Armstrong number",original);
else
    printf("\n%d is not Armstrong number",original);

getch();
}

```

Output:

Enter number : 153
153 is Armstrong number

Enter number : 173
173 is not Armstrong number

4. Write a C program to print 0 1 1 2 3 5 8 13 21 34 55 ... (Fibonacci Series).

```

#include<stdio.h>
#include<conio.h>
void main()
{
    int n,i;
    int x = 0,y = 1,z;
    clrscr();
    printf("Enter number of Series : ");
    scanf("%d",&n);

    printf("\nFibonacci Series : ")

    printf("\n%d %d ",x,y);

    for( i=3 ; i<=n ; i++ )
    {
        z = x + y;
        x = y;
        y = z;

        printf(" %d ",z);
    }

    getch();
}

```

Output:

```
Enter number : 17
17 is PRIME number
```

```
Enter number : 34
34 is NOT PRIME number
```

5. Program to print 0 1 1 2 3 5 8 13 21 34 55 ... (Fibonacci Series).

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int n,i;
    int x = 0,y = 1,z;
    clrscr();
    printf("Enter number of Series : ");
    scanf("%d",&n);

    printf("\nFibonacci Series : ")

    printf("\n%d %d ",x,y);

    for( i=3 ; i<=n ; i++ )
    {
        z = x + y;
        x = y;
        y = z;

        printf(" %d ",z);
    }

    getch();
}
```

Output:

```
Enter number of Series : 13
```

```
0 1 1 2 3 5 8 13 21
34 55 89 144
```

6. Program to print following pattern.

```
9 8 7 6 5 4 3 2
9 8 7 6 5 4 3
9 8 7 6 5 4
9 8 7 6 5
9 8 7 6
9 8 7
9 8
9
```

```
#include<stdio.h>
#include<conio.h>
void main()
{
    int a,b;
    for(a=1;a<=9;a++)
    {
        for(b=9;b>a;b--)
        {
            printf("%d",b);
        }
        printf("\n");
    }
    getch();
}
```

7. Program to print following pattern

```
*
**
***
****
*****
*****
*****
*
**
***
****
*****
*****
|||
```

FLAG OF NEPAL

```

#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c;
clrscr();
for(a=1;a<=7;a++)
{
    for(b=1;b<=a;b++)
    {
        printf("*");
    }
    printf("\n");
}
for(a=1;a<=7;a++)
{
    for(b=1;b<=a;b++)
    {
        printf("*");
    }
    printf("\n");
}
printf("||\n||\n| |\n|\n\n\nFLAG OF NEPAL");
getch();
}

```

EXERCISE**MCQ**

1. C supports how many basic looping constructs

(a) 2	(b) 3	(c) 4	(d) 6
-------	-------	-------	-------

Ans. : (b)
2. A statement differs from expression by terminating with a

(a) ;	(b) :	(c) NULL	(d) .
-------	-------	----------	-------

Ans. : (a)
3. What should be the expression return value for a do-while to terminate

(a) 1	(b) 0	(c) -1	(d) NULL
-------	-------	--------	----------

Ans. : (b)
4. Which among the following is an unconditional control structure

(a) do-while	(b) if-else	(c) goto	(d) for
--------------	-------------	----------	---------

Ans. : (c)

5. Continue statement is used
 (a) to go to the next iteration in a loop (b) come out of a loop
 (c) exit and return to the main function (d) restarts iterations from the beginning of the loop
Ans. : (a)
6. Which operator in C is called a ternary operator
 (a) if..then (b) ++ (c) ?: (d) ()
Ans. : (c)
7. Which of the following is a keyword is used for a storage class
 (a) printf (b) external (c) auto (d) scanf
Ans. : (c)
8. The continue command cannot be used with
 (a) for (b) switch (c) do (d) while
Ans. : (a)

■ Questions

1. Explain switch statement with example.
2. Give name of all the control statements in 'C'.
3. Explain if...else statement with suitable 'C' example
4. Explain else...if ladder with example.
5. Explain goto Statements.
6. Give the difference between break and goto.
7. Explain nested if..else statements.
8. Explain various types of loop available in C with example.
9. Explain break and continue with example.
10. State the difference between:
 - (i) Entry controlled loop & Exit controlled loop
 - (ii) While & Do ... while
 - (iii) While & For
 - (iv) Break & Continue
 - (v) Break & Goto

■ Programs exercises

1. W.A.P to show that given no is even or odd.
2. W.A.P to find the largest numbers among three numbers.
3. W.A.P to demonstrate 'else if' ladder.

4. W.A.P to menu driven using switch case statement.
5. W.A.P. to find out odd & even numbers from 1 to 10 numbers.
6. W.A.P. to find out factorial of given numbers.
7. W.A.P. to display the following.

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

8. W.A.P. to display the following.

1
2 3
4 5 6
7 8 9 10

9. W.A.P to display the following.

1
2 2
3 3 3
4 4 4 4
5 5 5 5 5

GTU Exam Paper Solution

Questions 1 Marks

1. Find the correct output of the following code. main()

Winter 2019

```
{ int x =
    3%2, y =
    3/2; if (x
        == y)
        printf("One is true ");
    else printf("One is false");}
```

- | | |
|------------------|-------------------------------------|
| (A) One is true | (B) One is true One is false |
| (C) One is false | (D) Error because of misplaced else |

Ans. : (A)

Questions 2 Marks

2. Why loop control statement used in 'C'.

Winter 2019

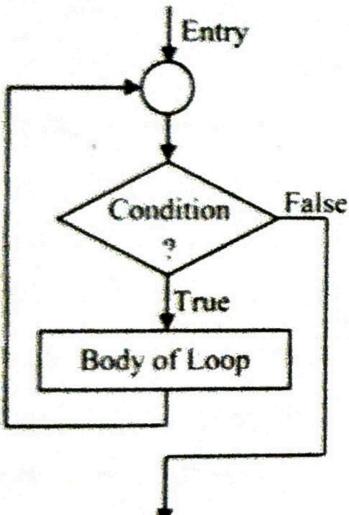
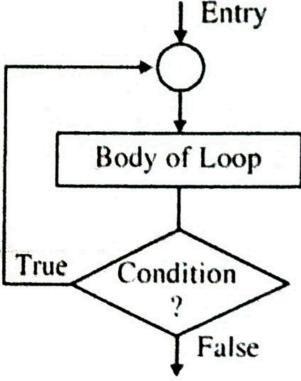
Ans. Loop control statements in C are used to perform looping operations until the given condition is true. Control comes out of the loop statements once condition becomes false.

Questions 3 Marks

1. Differentiate : entry-controlled loop vs exit-controlled loop.

Winter 2019

Ans. There are two types of loop structure: Entry-controlled Loop and Exit-controlled Loop

Entry-controlled Loop	Exit-controlled Loop
<ul style="list-style-type: none"> - It is also known as Pre-test Loop. - In the Entry-controlled Loop, the conditions are tested before the start of the loop execution. If the conditions are not satisfied, then the body of the loop will not be executed. - For Example: while loop and for loop. -  <p style="text-align: center;">Entry-controlled Loop</p>	<ul style="list-style-type: none"> - It is also known as Post-test Loop. - In the Exit-controlled Loop, the conditions are tested at the end of the body of the loop and therefore the body is executed unconditionally for the first time. - For Example: do...while loop. -  <p style="text-align: center;">Exit-controlled Loop</p>

2. Rewrite the following code with conditional operator.

Winter 2019

```
if (x %5 == y/4)
    z = sum / n + 1;
else
    z = n / sum - 1;
```

Ans. $z = (x \% 5 == y / 4) ? \text{sum} / \text{n} + 1 : \text{n} / \text{sum} - 1$

3. Give difference between break and continue

Winter 2018

Differentiate the break and continue statement.

Summer 2019

Ans.

BREAK	CONTINUE
1. It terminates the execution of remaining iteration of the loop.	1. It terminates only the current iteration of the loop.
2. 'break' resumes the control of the program to the end of loop enclosing that 'break'.	2. 'continue' resumes the control of the program to the next iteration of that loop enclosing 'continue'.
3. It causes early termination of loop.	3. It causes early execution of the next iteration.
4. 'break' stops the continuation of loop.	4. 'continue' do not stops the continuation of loop, it only stops the current iteration.
5. 'break' can be used with 'switch', 'label'.	5. 'continue' can not be executed with 'switch' and 'labels'.

4. Explain switch-case statement with example.

Winter 2018

Ans. Refer 3.5

5. Write a C program to print following pattern using loop.

Winter 2018

```

    1
   1   2
  1   2   3
 1   2   3   4

```

Ans.

```

#include <stdio.h>
#include<conio.h>
int main()
{
int i, j, Num, SP=40;
printf("Enter your row:");
scanf("%d", &Num);
for(i=1;i<=Num;i++)
{
    for(j=1;j<=SP;j++)
    {
        printf(" ");
    }
    for(j=1;j<=i;j++)
    {
        printf(" %d", j);
    }
}

```

```

printf("\n");
SP--;
}
getch();
return 0;
}

```

6. Explain Nested For loop with example.

Winter 2018

Ans. Please refer 3.10

7. Explain Enumerated data types and typedef statement

Winter 2018

Ans. Please refer 6.1

8. Explain Do-While loop with example.

Winter 2018

Ans. Please refer 3.9

9. Write a C program to check whether a number entered by user is positive or negative number using conditional operator.

Winter 2018

Ans.

```

#include <stdio.h>

int main()
{
    int a;

    printf("Enter an integer number\n");
    scanf("%d", &a);

    (a > 0) ? printf("%d is positive\n", a) : printf("%d is Negative\n", a);

    return 0;
}

```

10. Write a program to check whether the blood donor is eligible or not for donating blood. The conditions laid down areas listed.

Summer 2019

1. Age should be greater than 18 years but not more than 55 years.
2. Weight should be more than 45 kg.

Ans.

```

#include <stdio.h>

int main()
{
    int age, weight;

    printf("Enter age\n");

```

3. Decision Statements and Control Structures

```

scanf("%d", &age);
printf("Enter weight\n");
scanf("%d", &weight);
if(weight>45)
{
    if(age>18 && age<55)
        printf("you can donate blood");
    else
        printf("you cannot donate blood");
}
else
    printf("you cannot donate blood");

return 0;
}

```

11. Explain if-else-if Ladder statement with syntax and example.

Summer 2019

Ans. Please refer 3.4

12. Why goto statement is avoided ?

Summer 2019

Ans. Because it makes difficult to trace the control flow of a program, making the program hard to understand and hard to modify

13. Write a program to print following patter using loop.

Summer 2019

```

cc
ccc
cccc

```

Ans.

```

#include <stdio.h>
#include<conio.h>
int main()
{
    int i,j;

    for(i=1; i<=5; i++)
    {
        for(j=1; j<=i; j++)
        {
            printf("C");
        }
        printf("\n");
    }
    getch();
    return 0 ;
}

```

Questions 4 Marks

1. Write a C program to print following pattern using loop.

```

      1
    1   2
  1   2   3
1   2   3   4
  
```

Winter 2018

Ans.

```

#include <stdio.h>
#include<conio.h>
void main()
{
int i, j, NUM ;
clrscr();
printf("Enter your Number of Rows:");
scanf("%d", &NUM);
for(i=0;i<=NUM;i++)
{
for(j=0;j<=i;j++)
{
printf("*");
}
printf("\n");
}
getch();
}
  
```

2. Explain the syntax of *switch...case* statement with example.

Winter 2019

Ans. Please refer 3.5

3. Explain forward and backward jump in a program using *goto* statement

Ans. Jump can be either in forward direction or in backward direction.

(a) **Forward goto :** In this control moves forward at some specified level in the program. If the label: is before the statement goto label; some statements will be executed repeatedly. The syntax of this is like:

Syntax	Example
Statement1; Statement2; goto Label; ————— Statement3; Label: ←————— Statement4;	int a=10, b=20, c, d; c = a+ b; d = b-a; printf("%d", c); goto label; printf("%d", d); label:

In the above example after the statement2, statement4 will be executed because after statement2 the flow will turn towards statement4 and statement3 will be skipped.

- (b) **Backward goto :** In this control, moves backward at some specified level in the program. If the label: is placed after the goto label; some statements will be skipped .The syntax of this is like:

Syntax	Example
Statement1;	int i=1;
Statement2;	take:
Label: ←	if(i>=10)
Statement3;	printf("%d", i);
goto Label;	else
Statement4;	{
	i++;
	goto take;
	}

In the above example after the statement4, statement3 and statement4 will be executed again and again until some specified condition not met to exit from this loop.

4. Write a C program to print the entered integer infinite times on the screen.

Winter 2019

Ans:

```
#include <stdio.h>
#include<conio.h>
int main()
{
    int i=1,n;
    printf("Enter no:");
    scanf("%d",&n);

    while(i)
    {
        printf("%d\n", n);
    }
    getch();
    return 0;
}
```

5. Explain Else-If ladder statement with suitable example

Winter 2018

Please refer 3.4

6. Give the general structure of switch Statement and explain.

Summer 2019

Please refer 3.5

7. Write a program to find out the sum of digit of a number using while loop.

Summer 2019

Write a C program to find the sum of digits for the entered number.

Winter 2019

(For example, if the input is 124 then program should print 7. i.e. $1+2+4 = 7$)

Ans.

```
#include<stdio.h>
int main()
{
    int n,sum=0,m;
    printf("Enter a number:");
    scanf("%d",&n);
    while(n>0)
    {
        m=n%10;
        sum=sum+m;
        n=n/10;
    }
    printf("Sum is=%d",sum);
    return 0;
}
```

8. What is a Loop? Explain for loop with syntax and example.

Summer 2019

Ans. Please refer 3.7

Questions 5 Marks

1. Explain nested *if* with syntax and example

Winter 2019

Ans. Please refer 3.3

2. Write a C program to evaluate the series: $1 - 2 + 3 - 4 + \dots \pm N$. Here, N is input from Keyboard.

Ans.

Winter 2019

```
#include<stdio.h>

int main()
{
    int i,N,sum;

    /*read value of N*/
    printf("Enter the value of N: ");
    scanf("%d",&N);

    /*set sum by 0*/
    sum=0;
```

```
/*calculate sum of the series*/  
for(i=1;i<=N;i++)  
    sum= sum+ i;  
  
/*print the sum*/  
  
printf("Sum of the series is: %d\n",sum);  
  
return 0;  
}
```

2. Write a C program to find the factorial of the entered number

Winter 2019

Ans:

```
#include <stdio.h>  
#include<conio.h>  
void main()  
{  
int i, j, Fact=1;  
clrscr();  
printf("Enter Any Number:\n");  
scanf("%d", &j);  
for(i=j; i>=1; --i)  
{  
Fact = Fact * i;  
}  
printf("Factorial of Given Number Is= %d", Fact);  
getch();  
}
```
