Objective(s):

To understand the programming knowledge using Decision Statements (if, if-else, ifelse if ladder, switch and GOTO)

1. Write a program to input marks of 5 subjects (Physics, Chemistry, Math, English& Biology) for a student. Display the rank of each subjects and also the result of total marks and percentage obtained with his/her rank in the class. The rank is categorized as fail (marks < 40%), pass & third division (marks between 40 to 55%), second (marks between 55 to 65%), first (marks between 65 to 80%), Distinction (marks between 80 to 95%), extra ordinary (marks above 95 to 100%).

```
#include<stdio.h>
#include<conio.h>
#include<stdlib.h>
int main()
{
    float p,c,b,m,e,percent;
    printf("Enter your marks in
    physics:\t"); scanf("%f",&p);
    printf("\nEnter your marks in chemistry:\t");
    scanf("%f",&c);
    printf("\nEnter your marks in biology:\t");
    scanf("%f",&b);
    printf("\nEnter your marks in math:\t");
    scanf("%f",&m);
    printf("\nEnter your marks in english:\t");
    scanf("%f",&e);
    system("cls");


    /*Determining rank for physics*/
    if(p<40)
    {
        printf("\nYou failed in physics");
    }
    else if(p>=40&&p<55)
```

```c
    {
        printf("\nyou've passed in physics and your
rank}is third division");
    else if(p>=55&&p<65)
    {
        printf("\nyou've passed in physics and your
rank}is second division");
    else if(p>=65&&p<80)
    {
        printf("\nyou've passed in physics and your
rank}is first division");
    else if(p>=80&&p<95)
    {
        printf("\nyou've passed in physics and your
rank}is distinction");
    else if(p>=95&&p<=100)
    {
        printf("\nyou've passed in physics and your
rank}is extraordinary");


    /*Determining rank for chemistry*/

        if(c<40)
    {
        printf("\nYou failed in chemistry");
    }
    else if(c>=40&&c<55)
    {
        printf("\nyou've passed in chemistry and your
rank}is third division");
    else if(c>=55&&c<65)
    {
        printf("\nyou've passed in chemistry and your
rank}is second division");
    else if(c>=65&&c<80)
```

```c
    {
        printf("\nyou've passed in chemistry and your
rank}is first division");
    else if(c>=80&&c<95)
    {
        printf("\nyou've passed in chemistry and your
rank}is distinction");
    else if(c>=95&&c<=100)
    {
        printf("\nyou've passed in chemistry and your
rank}is extraordinary");


    /*Determining rank for
    math*/  { if(m<40)
        printf("\nYou failed in math");
    }
    else if(m>=40&&m<55)
    {
        printf("\nyou've passed in math and your rank
is third division");
    }
    else if(m>=55&&m<65)
    {
        printf("\nyou've passed in math and your rank
is second division");
    }
    else if(m>=65&&m<80)
    {
        printf("\nyou've passed in math and your rank
is first division");
    }
    else if(m>=80&&m<95)
    {
        printf("\nyou've passed in math and your rank
is distinction");
    }
    else if(m>=95&&m<=100)
    {
```

```c
        printf("\nyou've passed in math and your rank is extraordinary");
    }



    /*Determining rank for biology*/
    { if(b<40)
        printf("\nYou failed in biology");
    }
    else if(b>=40&&b<55)
    {
        printf("\nyou've passed in biology and your rank}is third division");
    else if(b>=55&&b<65)
    {
        printf("\nyou've passed in biology and your rank}is second division");
    else if(b>=65&&b<80)
    {
        printf("\nyou've passed in biology and your rank}is first division");
    else if(b>=80&&b<95)
    {
        printf("\nyou've passed in biology and your rank}is distinction");
    else if(b>=95&&b<=100)
    {
        printf("\nyou've passed in biology and your rank}is extraordinary");



    /*Determining rank for english*/
    { if(e<40)
        printf("\nYou failed in english");
    }
```

```c
    else if(e>=40&&e<55)
    {
            printf("\nyou've passed in english and your
rank}is third division");
    else if(e>=55&&e<65)
    {
            printf("\nyou've passed in english and your
rank}is second division");
    else if(e>=65&&e<80)
    {
            printf("\nyou've passed in english and your
rank}is first division");
    else if(e>=80&&e<95)
    {
            printf("\nyou've passed in english and your
rank}is distinction");
    else if(e>=95&&e<=100)
    {

            printf("\nyou've passed in english and your
rank}is extraordinary");
     printf("\n\n*********************************
     *
*********************");
    percent=(p+c+b+m+e)/5;
    printf("\n Your percentage is %f",percent);
    if(p<40||b<40||c<40||m<40||e<40)  /*Student  will
be failed if he/she fails atleast in one subject*/

    {
        printf("\nYou failed in exam");
    }
    else
    {

            {if(percent<40)
                printf("\nYou failed in exam");
            }
            else if(percent>=40&&percent<55)
```

```c
                {
                        printf("\nyou've passed in exam and
your rank is}third division");
                else if(percent>=55&&percent<65)
                {
                        printf("\nyou've passed in exam and
your rank is}second division");
                else if(percent>=65&&percent<80)
                {
                        printf("\nyou've passed in exam and
your rank is}first division");
                else if(percent>=80&&percent<95)
                {
                        printf("\nyou've passed in exam and
your rank is}distinction");
                else if(percent>=95&&percent<=100)
                {
                        printf("\nyou've passed in exam and
your rank is}extraordinary");
        }
    getch();
    return 0;

}
```

2. Write a program to find the largest and smallest among three entered numbers and also display whether the identified largest/smallest number is even or odd.

```c
#include<stdio.h>
#include<conio.h>
int main()
{
    int a,b,c,l,s;
    printf("Enter three numbers:\t");

    scanf("%d%d%d",&a,&b,&c);

    /*to check the greatest number*/
```

```c
if(a>b)
{
    if(a>c)
    {
        l=a;
    }
    else
    {
        l=c;
    }
}
else
{
    if(b>c)
    {
        l=b;
    }
    else
    {
        l=c;
    }
}

/*to check the smallest number*/
if(a<b)
{
    if(a<c)
    {
        s=a;
    }
    else
    {
        s=c;
    }
}
else
{
    if(b<c)
    {
        s=b;
    }
    else
    {
        s=c;
    }
```

```c
    }
    if(l%2==0)
    {
even",l);printf("\nThe largest number is %d and it is
    }
    else
    {
odd",l); printf("\nThe largest number is %d and it is
    }
    if(s%2==0)
    {
        printf("\nThe smallest number is %d and it is
even",s);
    }
    else
    {
odd",s); printf("\nThe smallest number is %d and it is
    }
    getch();
    return 0;
}
```

3. Write a program to check whether input alphabet
   is vowel or not using if-else and switch statement.

```c
/*Write a program to check whether input alphabet is
vowel or not
using if-else and switch statement*/


#include<stdio.h>
#include<conio.h>
int main()
{
    char c;
    printf("Enter any alphabet:\t");
    scanf("%c",&c);
    if (c=='a'||c=='e'||c=='i'||c=='o'||c=='u'||
c=='A'||c=='E'||c=='I'||c=='O'||c=='U') /*Vowel can
be in both uppercase and lowercase*/
        printf("%c is a vowel",c);
```

```c
    else
    {
        printf("%c is not vowel",c);
    }
    getch();
    return 0;
}


#include<stdio.h>
#include<conio.h>
int main()
{
    char c;
    printf("Enter any alphabet:\t");
    scanf("%c",&c);
    switch(c)
    {
    case 'a':
    case 'A':
    case 'e':
    case 'E':
    case 'i':
    case 'I':
    case 'o':
    case 'O':
    case 'u':
    case 'U':
        printf("%c is vowel",c);
        break;
    default:
        printf("%c is not vowel",c);
    }
    getch();
    return 0;
}
```

4. Write a program to get input of two or higher digit integer number and display in reverse order.

```c
/*Write a program to get input of two or higher digit integer number
and display in reverse order.*/


#include<stdio.h>
#include<conio.h>
int main()
{
    int num,r,rev=0,t;
    printf("Enter two or more digit number:\t");
    scanf("%d",&num);
    t=num;
    do
    {
                              4.  /*Extracts last digit
                              /*generates reverse
                              /*removes last digit from
        r=num%10;
from num*/

number*/rev=(rev*10)+r;num=num/10

; original number*/

    }while(num>0);
    printf("\nThe number %d in reverse order is %d",t,rev);
    getch();
    return 0;

}
```

5. Write a program that asks a number and test the number whether it is multiple of 5 or not, divisible by 7 but not by eleven.

/*Write a program that asks a number and test the number whether it
is multiple of 5 or not, divisible by 7 but not by

eleven.*/

```c
#include<stdio.h>
#include<conio.h>
int main()
```

```c
{
    int a;
    printf("Enter any number:\t");
    scanf("%d",&a);
    if((a%5)==0)
    {
        printf("\n%d is divisible by 5",a);
    }
    else
    {
        printf("\n%d is not divisible by 5",a);
    }



    if((a%7)==0)
    {
        if((a%11)!=0)
        {
            printf("\n%d is divisible by 7 but not by 11",a);
        }
    }
    else
    {
        if((a%11)!=0)
        {
            printf("\n%d is not divisible by 7 and not by 11",a);
        }
    }
    getch();
    return 0;
}
```

6.   Write a program to check whether the entered year
  is leap year or not (a year is leap if it is
  divisible by 4 and divisible by 100 or 400.)

```c
#include<stdio.h>
#include<conio.h>
int main()
{
    int y;
    printf("Enter year:\t");
    scanf("%d",&y);
    if(y%4==0)
    {
        if(y%100==0)
        {
            if(y%400==0)
            {
                printf("\n%d is leap year",y);
            }
            else
            {
                printf("\n%d is not leap year",y);
            }
        }
        else
        {
            printf("\n%d is leap year",y);
        }
    }
    else
    {
        printf("\n%d is not leap year",y);
    }
    getch();
    return 0;
}
```

7.   Write a program to read the values of
  coefficients a, b and c of a quadratic equation
  ax2+bx+c=0 and find roots of the equation.

/*Write a program to read the values of coefficients

a, b and c of a

quadratic equation ax2+bx+c=0 and find roots of the equation.*/

```c
#include<stdio.h>
#include<conio.h>
#include<math.h>
int main()
{
    float a,b,c,d,root1,root2;
    printf("Enter the value of a,b,c:\t");
    scanf("%f%f%f",&a,&b,&c); d=(b*b)-
    4*a*c;
    if (d>=0)
    {
        root1=(-b+sqrt(d))/(2*a);
        root2=(-b-sqrt(d))/(2*a);
        printf("\nThe root of the equation are %f and
%f",root1,root2);

    }
    else
    {
        d=d*(-1);
        root1=sqrt(d)/(2*a);
        printf("The root of the equation are:\n
%f+i(%f)",(-b/(2*a)),root1);
        printf("\n%f-i(%f)",(-b/(2*a)),root1);
    }
    getch();
    return 0;
}
```