Write a C Program for the following problem statements

1. **Check Whether a Character is a Vowel or Consonant (Using if)**

   Solution:-

```
#include<stdio.h>

void main()
{
char ent;
printf("enter");
scanf("%c",&ent);

if(ent=='a'||ent=='e'||ent=='i'||ent=='o'||ent=='u')
printf("vowel");

 if(ent !='a' && ent != 'e' && ent
!= 'i' && ent != 'o' && ent !='u')
 printf("consonant");

}
```

2. **Find Roots of a Quadratic Equation (Using else if ladder)**

   Solution:-

```
#include <stdio.h>
#include <math.h>

void main()
{
    int a,b,c,d;
    float x1,x2;
```

```
    printf("Input the value of a,b & c : ");
    scanf("%d%d%d",&a,&b,&c);
    d=b*b-4*a*c;
    if(d==0)
    {
      printf("Both roots are equal.\n");
      x1=-b/(2.0*a);
      x2=x1;
      printf("First  Root Root1= %f\n",x1);
      printf("Second Root Root2= %f\n",x2);
    }
    else if(d>0)
        {
           printf("Both roots are real and diff-2\n");
           x1=(-b+sqrt(d))/(2*a);
           x2=(-b-sqrt(d))/(2*a);
           printf("First  Root Root1= %f\n",x1);
           printf("Second Root root2= %f\n",x2);
        }
        else
             printf("Root are imeainary;\nNo Solution. \n");
}
```

3.Check Leap Year (Using if..else)

Solution :-

```
#include<stdio.h>

void main()
{
```

```
int a;
printf("enter");
scanf("%d",&a);

if(a%2==0)
printf("leap year");
else
printf("not leap year");
}
```

4. check which number nearest to the value 100 among two given integers. Return 0 if the two numbers are equal. (Using nested if...else)

Solution:-

```
#include<stdio.h>

Void main()
{
int a,b,c,d;
printf("enter");
scanf("%d",&a);
printf("enter");
scanf("%d",&b);
c=100-a;
d=100-b;
if(a<b)
printf("%d nearer to 100",a);
else if(a>b)
printf("%d is nearer to 100",b);
```

```
else
printf("both are eaual ,so 0");

}
```

5. check three given integers (small, medium and large) and return true if the difference between small and medium and the difference between medium and large is same. (Using nested if...else)

Solution:-

```
#include <stdio.h>
int main()
{
int small,medium,large,a,b;
printf("enter small ");
scanf("%d",&small);
printf("enter medium ");
scanf("%d",&medium);
printf("enter small ");
scanf("%d",& large);

a=medium-small;
b=large-medium;

if(a==b)
printf("True");
else if(a>b)
printf("Difference is not equal");
else
```

```
        printf("Difference is not equal");
        return 0;
}
```

6. Calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :

   Unit Charge/unit

   upto 199 @1.20

   200 and above but less than 400 @1.50

   400 and above but less than 600 @1.80

   600 and above @2.00 .

   If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/- (Using else if ladder)

   Solution:-

```
#include<stdio.h>

void main()
{

int id;
char name[30];

float  unit,bill;
printf("enter name");
scanf("%s",name);

printf("enter I'd ");
scanf("%d",&id);
```

```
printf("enter unit");
scanf("%f",&unit);

if(unit<=199)

{
bill=unit*1.20;
if(bill>=400)
{
printf("\nName=%s",name);
printf("\nTotal=%.2f",bill*15/100+bill);
printf("\nid=%d",id);
}
else if(bill<100)
{
printf("\nName=%s",name);
printf("\n total=100.00");
printf("\nid=%d",id);
}

else
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal =%.2f",bill);
}

}
```

```
else if(unit>=200 && unit<400)

{
bill=unit*1.50;
if(bill>=400)
{

printf("\nName=%s",name);

printf("\nid=%d",id);
printf("\nTotal=%.2f",bill*15/100+bill);
}
else if(bill<100)
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal=100.00");
}
else
{
printf("\nName=%s",name);

printf("\nid=%d",id);
printf("\nTotal =%.2f",bill);
}
}
else if(unit >=400 && unit<600)
{
bill=unit*1.80;
```

```
if(bill>=400)
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal=%.2f",bill*15/100+bill);
}

else if(bill<100)
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal=100.00");
}
else
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal =%.2f",bill);
}
}

else

{
bill=unit*2.00;
if(bill>=400)
{
printf("\nName=%s",name);
printf("\nid=%d",id);
```

```
printf("\nTotal=%.2f",bill*15/100+bill);

}
else if(bill<100)
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal=100.00");

}
else
{
printf("\nName=%s",name);
printf("\nid=%d",id);
printf("\nTotal =%.2f",bill);
}
}
}
```

7. The marks obtained by a student in 3 different subjects are input by the user. Your program should calculate the average of subjects. The student gets a grade as per the following rules: (Using else if ladder)

Average Grade

90-100 A

80-89 B

70-79 C

60-69 D

0-59 F

Solution :-

```
#include<stdio.h>

 void main()
{

int a,b,c;

float d,e;
printf("enter PDSC mark out of 100");
scanf("%d",&a);
printf("enter DBMS mark out of 100");
scanf("%d",&b);
printf("enter English mark out of 100");
scanf("%d",&c);

d=a+b+c;
e=d/300*100;

if(e>=90)
printf("Grade A");
else if(e>=80)
printf("grade B");
else if(e>=70)
printf("Grade c");
else if(e>=60)
printf("Grade D");
else
printf("Grade F");
```

```
}
```

8. print total number of days in a month using switch case.

Solution:-

```
#include<stdio.h>

 void main()
{

int a,b;
printf("enter month");
scanf("%d",&a);
printf("enter year");
scanf("%d",&b);

switch (a)
{
case 1:
printf("31 days");
break;

case 2:
if(b%2==0)
printf("29 days");
else
printf("28 days");
break;

case 3:
printf("31 days");
```

```
break;

case 4:
printf("30 days");
break;
case 5:
printf("31 days");
break;
case 6:
printf("30 days");
break;
case 7:
printf("31 days");
break;
case 8:
printf("31 days");
break;
case 9:
printf("30 days");
break;
case 10:
printf("31 days");
break;
case 11:
printf("30 days");
break;
case 12:
printf("31 days");
break;
```

```
default:
printf("not valid month");

}
}
```

9. create Simple Calculator using switch case.

Solution:- #include<stdio.h>

```
 void main()
{
int a,b,c;
printf("enter number");
scanf("%d",&a);

printf("enter 1 for +,2 for-,3 for *,4 for / ");
scanf("%d",&b);

printf("enter number");
scanf("%d",&c);


switch (b)
{
case 1:
printf("sum=%d",a+c);
break;
case 2:
printf("subtraction=%d",a-c);
break;
```

```
case 3:
printf("multiplication=%d",a*c);
break;
case 4:
printf("division=%d",a/c);
break;
default:
printf("invalid operator");

}

}
```

10. Prompts the user to enter grade. Your program should display the corresponding meaning of grade as per the following table (Using Switch Case)

Grade and Meaning

A Excellent

B Good

C Average

D Deficient

F Failing

Solution:-

```
#include<stdio.h>

 void main()
{
char a;
printf("enter grade in uppercase=");
scanf("%c",&a);
switch(a)
```

```
{
case 'A':
printf("Excellent");
break;
case 'B':
printf("Good");
break;
case 'C':
printf("Average");
break;
case 'D':
printf("Deficient");
break;
case 'E':
printf("failing");
break;
default:
printf("invalid grade");

}

}
```

Practice Questions [Optional]:

11. Check whether a triangle is Equilateral, Isosceles or Scalene.

Solution:-

```
#include <stdio.h>
```

```
int main()
{
    int sidea, sideb, sidec;


    printf("Input three sides of triangle: ");
    scanf("%d %d %d", &sidea, &sideb, &sidec);

    if(sidea==sideb && sideb==sidec)
    {
        printf("This is an equilateral triangle.\n");
    }
    else if(sidea==sideb || sidea==sidec || sideb==sidec) //check whether two sides are equal
    {
        printf("This is an isosceles triangle.\n");
    }
    else
    {
        printf("This is a scalene triangle.\n");
    }

    return 0;
}
```

12. Check Whether a Number is Even or Odd

Solution :-

```
#include<stdio.h>
```

```
 void main()
{
int a;
printf("enter number");
scanf("%d",&a);

if(a%2==0)
printf("Even number");
else
printf("Odd number");
}
```

13. Check Whether a Character is an Alphabet or not.

Solution:-

```
#include<stdio.h>
void main()
{
 char ch;
 printf("Enter any character ");
 scanf("%c", &ch);

if((ch >= 'a' && ch <= 'z' )||(ch >= 'A' && ch <= 'Z'))
 printf("%c is a character", ch);
 else
 printf("%c is not a character", ch);


}
```

14. Find the Largest Number Among Three Numbers.

Solution:-

```
#include<stdio.h>

 void main()
{
int a,b,c;
printf("enter number");
scanf("%d",&a);
printf("enter number");
scanf("%d",&b);
printf("enter number");
scanf("%d",&c);

if(a>b)

if(a>c)
printf("%d is the greatest num",a);
else
printf("%d is the greatest num",c);

else if(b>c)

printf("%d is the greatest num",b);

else

printf("%d is the greatest num",c);
```

```
}
```

19. print day of week name using switch case.

Solution:-

```
#include <stdio.h>
main()
{
int a;
printf("enter day number");
scanf("%d",&a);


switch(a)
{
case 1:
printf("Monday");
break;

case 2:
printf("Tuesday");
break;
case 3:
printf("Wednesday");
break;
case 4:
printf("Thursday");
break;
case 5:
```

```
printf("Friday");
break;
case 6:
printf("Saturday");
break;
case 7:
printf("Sunday");
break;

default:
printf("invalid number");
}

}
```