LAB-3

Objective(s):

To be familiar with formatted and unformatted I/O in C with preprocessor directives

1. Write a program to do the following

a) Get input of two float numbers in to variables x & y. receive the mathematical operator (+, -, *, /) using unformatted I/O into the variable Ch1 and perform operations on x & y and display the result.

```
#include<stdio.h>
#include<conio.h>
int main()
{
    float x,y,result;
    char ch1;
    printf("Enter any two
    number:\t"); scanf("%f%f",&x,&y);
    printf("\nEnter the mathematical opeartor
(+,-,*,/):\t");
    ch1=getche();
    switch(ch1)
    {
    case '+':
        result=x+y;
        printf("\nSum=%f",result);
        break;
    case '-':
        result=x-y;
        printf("\nDifference=%f",result);
        break;
    case '*':
        result=x*y;
        printf("\nProduct=%f",result);
        break;
    case '/':
        result=x/y;
        printf("\nquotient=%f",result);
        break;
    default:
        printf("\nEnter valid mathematical

operator");
```

```
    }
    getch();
    return 0;
}
```

b) Define the math operator '+' as PLUS, '-' as MINUS, '*' as MULT & '/' as DIVIDE using preprocessor directives and do the operations over variables (x,y) defined on above question like z=x PLUS y.

```
#include<stdio.h>
#include<conio.h>
#define PLUS +
#define MINUS -
#define MULT *
#define DIVIDE /
int main()
{
    float x,y,result;
    char ch1;
    printf("Enter any two
    number:\t"); scanf("%f%f",&x,&y);
    printf("\nEnter the mathematical opeartor
(+,-,*,/):\t");
    ch1=getche();
    switch(ch1)
    {
    case '+':
        result=x PLUS y;
        printf("\nSum=%f",result);
        break;
    case '-':
        result=x MINUS y;
        printf("\nDifference=%f",result);
        break;
    case '*':
        result=x MULT y;
        printf("\nProduct=%f",result);
        break;
    case '/':
        result=x DIVIDE y;
        printf("\nquotient=%f",result);
        break;
    default:
```

```
        printf("\nEnter valid mathematical
operator");
    }
    getch();
    return 0;
}
```

c) Get input of your name, address, age in years, weight and height from keyboard and display the information using unformatted I/O (String I/O).

```
#include<stdio.h>
#include<conio.h>
int main()
{
    char
    name[20],add[30],age[2],weight[3],height[4];
    printf("Enter your name:\t");
    gets(name);
    printf("Enter your address:\t");
    gets(add);
    printf("Enter your age:\t");
    gets(age);
    printf("Enter your
    weight:\t"); gets(weight);
    printf("Enter your height:\t");
    gets(height);
    system("cls");
    puts(name);
    puts(add);
    puts(age);
    puts(weight);
    puts(height);
    getch();
    return 0;

}
```

2. Write a program to produce the output as shown below:

x	y	expression	results
6	3	x=y+3	x=6

```
  6   |   3    |   x=y-2          |   x=1
  6   |   3    |   x=y*5          |   x=15
  6   |   3    |   x=x/y          |   x=2
  6   |   3    |   x=x%y          |   x=0
#include<stdio.h>
#include<conio.h>
int main()
{   int x,y,result;
    x=6,y=3;
    printf("%c%7c%18s
%16s\n",'x','y',"expressions","results");
    printf("%d%3c%4d%4c%8s%11c%6s
%d\n",x,'|',y,'|',"x=y+3",'|',"x=",(result=y+3));
    printf("%d%3c%4d%4c%8s%11c%6s
%d\n",x,'|',y,'|',"x=y-2",'|',"x=",(result=y-2));
    printf("%d%3c%4d%4c%8s%11c%6s
%d\n",x,'|',y,'|',"x=y*5",'|',"x=",(result=y*5));
    printf("%d%3c%4d%4c%8s%11c%6s
%d\n",x,'|',y,'|',"x=x/y",'|',"x=",(result=x/y));
    printf("%d%3c%4d%4c%8s%11c%6s
%d\n",x,'|',y,'|',"x=x%y",'|',"x=",(result=x%y));
    getch();
    return 0;
}
```

3. Given x=3.0, y=12.5, z= 523.3, A=300.0, B=1200.5, C=5300.3, Write a program to display the following:

```
X  y   z=    3.0|    12.5|  523.3|
           300.0
A  B   C=       |  1200.5| 5300.3|
-------------------------------------------------
-----------------
                              |
X  y   z=   |3.00    |12.50   523.30
                              |
            |        |        52300.
A  B   C=   300.00   1200.50  30
#include<stdio.h>
#include<conio.h>
int main()
{   float x,y,z,A,B,C;
    x=3.0,y=12.5,z=523.3;
    A=300.0,B=1200.5,C=5300.3
    ;
    printf("%c%3c%4s%7.1f%c%8.1f%c%8.1f
```

```
%c\n",'x','y',"z=",x,'|',y,'|',z,'|');
    printf("%c%3c%4s%7.1f%c%8.1f%c%8.1f
%c",'A','B',"C=",A,'|',B,'|',C,'|');
    printf("\n------------------------
    --------                                    \n");
    printf("%c%3c%4s%3c%-7.2f%c%-8.2f%c%-

8.2f\n",'x','y',"z=",'|',x,'|',y,'|',z);
```

```
    printf("%c%3c%4s%3c%-7.2f%c%-8.2f%c%-
8.2f\n",'A','B',"C=",'|',A,'|',B,'|',C);
    getch();
}
```

4. Given the three numbers a(=8), b(=4),c and constant value PI=3.1415, calculate and display the following result using macros (preprocessor directives)

a)c = PI * mult(a,b) //the macro mult(a,b) perform the multiplication of a & b(a*b)

```
#include<stdio.h>
#include<conio.h>
#define PI 3.1415
#define mult(x,y)(x*y)
int main()
{
    int a=8,b=4;
    float c;
    c=PI*(mult(a,b));
    printf("%f",c);
    getch();
    return 0;
}
```

b)c= PI* sum(a,b)//the macro mult(a,b) perform the sum of a & b (a+b)

```
#include<stdio.h>
#include<conio.h>
#define PI 3.1415
#define sum(x,y)(x+y)
int main()
{
    int a=8,b=4;
    float c;
    c=PI*sum(a,b);
    printf("%f",c);
    getch();
    return 0;
}
```

c)c= PI *sub(a,b)//the macro mult(a,b) perform the subtraction of a & b (a-b)

```
#include<stdio.h>
#include<conio.h>
#define PI 3.1415
#define sub(x,y)(x-y)
int main()
{
    int a=8,b=4;
    float c;
    c=PI*sub(a,b);
    printf("%f",c);
    getch();
    return 0;
}
```

d)c= PI*div(a,b)//the macro mult(a,b) perform the division of a & b (a/b)

```
#include<stdio.h>
#include<conio.h>
#define PI 3.1415
#define div(x,y)(x/y)
int main()
{
    int a=8,b=4;
    float c;
    c=PI*div(a,b);
    printf("%f",c);
    getch();
    return 0;
}
```

5. Demonstrate the differences among getch(), getche(), getchar(). Demonstrate the difference between scanf() & gets(), printf() & puts().

6. Write a program to take a character input from keyboard and check if it is a number or alphabet or special character using ASCII CODE. Again check if the character is using character functions below:

a)Alphanumeric (isalnum)
b)Blank character (isblank)
c)Alphabetic (isalpha)
d)Control character (iscntrl)
e)Number-digit (isdigit)
f)Upper case (isupper)
g)Lower case (islower)
h)Hexadecimal digit (ixdigit)
i)Graphical character (isgraph)

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

int main()
{
    char c;
    int ch;
    printf("Enter any character:\t");
    scanf("%c",&c);
    ch=c;
    if (ch>=48 && ch<=57)
    {
        printf("%c is number\n",c);
    }
    else if((ch>=65 && ch<=90)||(ch>=97 && ch<=122))
    {
        printf("%c is alphabet\n",c);
    }
    else if(ch>31)
    {
        printf("%c is special char\n",c);
    }


    if (isalnum(c)==0)
    {
        printf("%c is not alphanumeric\n",c);
    }
    else
    {
        printf("%c is alpha numeric\n",c);
    }
    if (isblank(c)==0)
```

```
{
    printf("%c is not blank character\n",c);
}
else
{
    printf("%c is blank character\n"),c;
}
if (isalpha(c)==0)
{
    printf("%c is not alphabetic\n",c);
}
else
{
    printf("%c is alphabetic\n",c);
}
if (iscntrl(c)==0)
{
    printf("%c is not control character\n",c);
}
else
{
    printf("%c is a control character\n",c);
}
if(isdigit(c)==0)
{
    printf("%c is not a number-digit\n",c);
}
else
{
    printf("%c is a number-digit\n",c);
}
if(isupper(c)==0)
{
    printf("%c is not in upper case\n",c);
}
else
{
    printf("%c is in upper case\n",c);
}
if (islower(c)==0)
{
    printf("%c is not in lower case\n",c);
}
else
```

```
    {
        printf("%c is in lower case\n",c);
    }
    if (isxdigit(c)==0)
    {
        printf("%c is not hexadecimal digit\n",c);
    }
    else
    {
        printf("%c is hexadecimal digit\n",c);
    }
    if (isgraph(c)==0)
    {
        printf("%c is not graphical character\n",c);
    }
    else
    {
        printf("%c is graphical character\n",c);
    }
    getch();
    return 0;
}
```