C-Programming Lab Sheet
I Year / I Part
Faculty: Computer/Electrical/Civil

Lab Revision

1. Type the following program and see the output.

```
#include<stdio.h>
#include<conio.h>
void main(void){
        printf("Welcome to C");
        getch();
}
```

Note: *To compile: Alt+F9, to run F2, give file name and .C extension before saving. Run this program without getch(). Run this program with clrscr() before printf(). Remove the semicolons and run the program. Right click on printf() and read the help of printf() function. Similarly right click on getch() to know more about it. In this everything can be studied using help. To remove the line(s) of program, enclose in /* */. This enclosing process is called commenting.*

2. Type the following program and run and see the output.

```
#include<stdio.h>
#include<conio.h>
void main(){
        int s, a, b;
        float p;
        printf("Address of s is %x", &s);
        printf("\n Address of a is %x", &a);
        printf("\n\n Memory space of s is %d", sizeof(1.5));
        printf("\n\n\n Size of p %d", sizeof(p));
        printf("\n\n\n\n Size of 1.5 is %d", sizeof(1.5));
        printf("\n\n\n\n\n Size of float data type is %d", sizeof(float));
        getch();   /* to make program wait until user enters any character */
}
```

Activity: *right click on int, float, sizeof, getch, void main, include, stdio.h, conio.h and study more about the term. What does \n do? Replace \n with \t and see the output. Similary use \a and run.*

3. WAP to read price of two pens and five copies and calculate the price after 10% discount.

4. A program that inputs seconds as input and converts to minutes.

```
#include<stdio.h>
void main(void){
        int seconds, min;
        printf("Enter number of seconds:");
        scanf("%d", &seconds);
        min = seconds/60;
        seconds = seconds%60;
        printf("\n Minutes=%d", min);
        printf("\n Seconds=%d", seconds);
}
```

5. A program to illustrate post fix increment operator.

```
#include<stdio.h>
void main(){
        int x=5,v;
        v=++x * ++x + ++x;
        printf("v=%d, x=%d\n", v,x);
}
```

6. Type, run and observe the output.

```
#include<stdio.h>
#include<conio.h>
void main(){
float a; char b; long int c; unsigned int e;
        clrscr();
        printf("Enter value for a");
        scanf("%f",&a);
        printf("Enter value of b:");
        scanf("%c",&b);
        printf("Enter value of c and e");
        scanf("%ld%u", &c, &e);
        printf("value of a: %f \n value of b: %c \n value of c: %ld \n value of e: %u",
        a,b,c,e);
        getch();
}
```

7. WAP to determine all roots of a quadratic equation $ax^2+bx+c=0$.

8. Write a program to evaluate the following function f(x) given by

   a. $=0$ if $x \leq 0$
   b. $=x(x-10)(x-15)$ if $0<x \leq 10$
   c. $=(x-10)(x-15)(x-20)$ if $10<x \leq 15$
   d. $=(x-15)(x-20)(x-30)$ if $15<x \leq 20$
   e. $=(x-20)(x-30)(x-40)$ if $20<x \leq 30$
   f. $=0$ for all other cases

9. WAP that asks an arithmetic operator and two operands and perform the corresponding operation on the operands.

10. You are given a task to develop a system to read at least 100 integer number and continue until the user enters "No". Your system must have capacity to calculate the sum and average of those numbers which are exactly divisible by 9 but not by 6 and lies in between 1 to 100 and display a suitable message if no such number is read". Write algorithm, flowchart and code to develop such system.

11. Write a program to display sum of even number for 1 to n. [n is an unsigned integer]

12. Write separate programs to check whether an unsigned integer entered by a user is a prime, twin prime, triangular or Armstrong number.

13. Write a program to display the chessboard pattern. [Hint: print "\xdb" for white color and print " " for black color.]

14. Write separate programs to display the terms of the following sequences up to nth term.

     a. 1,2,3,4,5+…….n
     b. s=2,4,6,8,10,12,14……..2n
     c. 1,2,4,10,17,26…….
     d. (12+22)/2,(22+32)/3, (32+42)/4,….
     e. 1, 1/3, 1/5, 1/7, 1/9, 1/11, 1/13…..1/2n-1.

15. Write separate program to evaluate the series up to nth terms.

     a. s=2+4+6+8+10+12+14+…..2n

     b. s=e-1 =1-1/1! + ½! − 1/3!+¼! -1/5!.....(-1)n+1/(n-1)!, n=1,2,3….

     c. f(x) = 1-x2/2!+x4/4!-x6/6!+x8/8!.....(-1)ix2i/2i! where i=0,1,2,3….

16. Write a program to evaluate the series until the term becomes less than 10-6.

     Sn=1+x/1!+x2/2!+x3/3!.....

17. Write separate program to print the following patterns using nested loop structure.

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

18. Write a program to read a non-negative integer in main(). Pass this integer to a function fact() having return type unsigned integer. This function calculate the factorial of the received number and return to main().

19. Write a program to create a function void check prime(); The task of this function is to read a number and check whether the number prime or not and display the appropriate message. Be sure, that a real number cannot be either prime or composite. What about negative number?

20. WAP to create functions: *int findLowest(int, int, int);* and *int findHighest(int,int,int);*. The task of **findLowest**() is to find the lowest of three integers and return an integer to the calling function and, similarly, the task of **findHighest**() is to find the highest of three integers and return an integers and return an integer to the calling function. Call these function in **main**() giving appropriate arguments. **Note**: *Use conditional operator (test expression? expression1 : expression2) to find highest and lowest number.*

21. Write a program using recursive function to compute series: $12-22+32-42\ldots(-1)n+1$ n2. Here, you cannot use pow() function and you should read the value of n from the user.

22. Write a program to compute the series.

$x-x^3/3!+x^5/5!-x^7/7!+x^9/9!.....(-1)n-1x^{(2n-1)}/(2n-1)!$, n=1,2,3,4,…..

Here, write recursive function to calculate xn and n!

23. Write a program to find the larger of two numbers using the concept of function and pointer. Here pass two numbers from main() to a function that finds the larger. Display the larger one from main() without using return statement.

24. Run the following program, observe the output and comment on that.

```
void main(){
        float marks[5];
        int i;
        printf("%d",marks);
        printf("address of different array elements");
        for(i=0;i<5;i++){
                printf("address of element %d is %u\n", i, marks[i]);
        }
        getch();
}
```
Note: *Is there any difference between using expressions and array[i] and (array+i)?*

25. C program to print all twin primes in a given range of numbers. **Hint**: Twin primes are two consecutive odd numbers which are both prime. For Examples: 3 & 5, 5 & 7, 11 & 13, 17 & 19, 29 & 31, etc.