PRACTICAL 03

01.

```
#include <stdio.h>
int main()
{
 int n1,n2,max;
 printf("Enter the first number:");
 scanf("%d",&n1);
 printf("Enter the second number:");
 scanf("%d",&n2);

 if(n1>n2)
   max=n1;
 else
   max=n2;

   printf ("the highest number is %d\n", max);
}
```

02.

```
#include<stdio.h>
int main()
{
   int n1,n2,n3,max,min;
   printf("Enter three numbers");
   scanf("%d%d%d",&n1,&n2,&n3);
   //larg among n1,n2,n3
   if(n1>n2)
      if(n1>n3)
         max=n1;
      else
         max=n3;
else
     if(n2>n3)
      max=n2;
     else
      max=n3;
//small among n1,n2,n3
   if(n1<n2)
      if(n1<n3)
         min=n1;
      else
         min=n3;
   else
     if(n2<n3)
      min=n2;
     else
      min=n3;

   printf("The largest is %d \n",max);
   printf("The smallest is %d \n",min);
}
```

03.

```
#include<stdio.h>
int main()
{
   float basic_salary  , new_salary , increment ;
   char e_name[20];
   printf("Enter employee name :");
   scanf("%s" , &e_name);
   printf("Basic salary :");
   scanf("%f" ,&basic_salary);

   if(basic_salary>=10000)
      increment = (15* basic_salary)/100;
   else if(basic_salary>=5000)
      increment = (10* basic_salary)/100;
   else
      increment = (5* basic_salary)/100;

   new_salary=basic_salary + increment;
   printf("%s - basic salary is %.2f" ,e_name , new_salary );
}
```

04.

```
#include<stdio.h>
int main()
{
const float pi = 3.14159;
float radius,diameter,circumference,area;

//read the radius from user
printf("Enter the radius of the circle:");
scanf("%f",&radius);

//calculate the diameter,circumference,area
diameter=2*radius;
circumference=2*pi*radius;
area=pi*radius*radius;

//print the result
printf("Diameter: %.2f\n",diameter);
printf("Circumference: %.2f\n",circumference);
printf("Area: %.2f\n",area);



}
```

05.

```
#include<stdio.h>
int main()
{
   int n1,n2;
   printf("Enter the first integer:");
   scanf("%d",&n1);
   printf("Enter the second integer:");
   scanf("%d",&n2);

   if  (n2!=0 && n1%n2==0)
   {
      printf("%d is a multiple of %d \n",n1,n2);
   }
   else {
      printf("%d is not a multiple of %d \n",n1,n2);
   }

}
```

06.

```
#include <stdio.h>
int main() {
    char uppercaseLetters[] = {'A', 'B', 'C'};
    char lowercaseLetters[] = {'a', 'b', 'c'};
    char digits[] = {'0', '1', '2'};
    char specialSymbols[] = {'$', '*', '+', '/'};
    char blankCharacter = ' ';

    printf("Integer equivalents of uppercase letters:\n");
    for (int i = 0; i < sizeof(uppercaseLetters) / sizeof(uppercaseLetters[0]); i++) {
        printf("%c: %d\n", uppercaseLetters[i], uppercaseLetters[i]);
    }
   printf("\nInteger equivalents of lowercase letters:\n");
    for (int i = 0; i < sizeof(lowercaseLetters) / sizeof(lowercaseLetters[0]); i++) {
        printf("%c: %d\n", lowercaseLetters[i], lowercaseLetters[i]);
    }
   printf("\nInteger equivalents of digits:\n");
    for (int i = 0; i < sizeof(digits) / sizeof(digits[0]); i++) {
        printf("%c: %d\n", digits[i], digits[i]);
    }
   printf("\nInteger equivalents of special symbols:\n");
    for (int i = 0; i < sizeof(specialSymbols) / sizeof(specialSymbols[0]); i++) {
        printf("%c: %d\n", specialSymbols[i], specialSymbols[i]);
    }
    printf("\nInteger equivalent of the blank character:\n");
    printf("%c: %d\n", blankCharacter, blankCharacter);
}
```

07.

```
#include<stdio.h>
int main()
{
   float basicSalary,monthlySales;
   char city;
   float additionalAllowance=0;
   float bonusPercentage=0;
   float bonusAmount=0;
   float grossRemuneration=0;
printf("Enter the basic salary:");
   scanf("%f", &basicSalary);
   printf("Enter the monthly sales:");
   scanf("%f", &monthlySales);
   printf("Enter the city(C for Colombo):");
   scanf("%c", &city);

   if(basicSalary>0 && monthlySales>0)
   {
      if(monthlySales>5)
         {additionalAllowance=basicSalary*0.1;}
      if(city=='C')
        {additionalAllowance+=2500;}
      if(monthlySales<=2500)
        {bonusPercentage=0.1; }
        else if(monthlySales>25000 && monthlySales<=50000)
        {bonusPercentage= 0.12;}
        else if(monthlySales>50000)
        {bonusPercentage=0.15;}
     //calculate bonus amount
    bonusAmount=monthlySales*bonusPercentage;
    //calculate gross remuneration
    grossRemuneration=basicSalary+additionalAllowance+bonusAmount;
  printf("Gross Monthly Remuneration:%.2f\n",grossRemuneration );
   }
   else
      {printf("Invalid input. Salary and sales amount must be positive.\n");}
}
```

PRACTICAL 04

Q1.

```
#include<stdio.h>
int main()
{
   int number;
   printf("Enter an integer:");
   scanf("%d",&number);

   if (number % 2==0)
   {
      printf("%d is an even number.\n", number);
   }
   else
      {
         printf("%d is an odd number.\n", number);
      }
}
```

Q2.

```
#include<stdio.h>
int main()
{
   int choice;
   double n1, n2;
   printf("Menu-Driven calculator\n");
   printf("1.Addition\n");
   printf("2.Subtraction\n");
   printf("3.Multiplication\n");
   printf("4.Division\n");
   printf("Enter your choice (1-4):");
   scanf("%d",&choice);
  printf("Enter two numbers:");
   scanf("%lf %lf",&n1,&n2);
```

```
    if (choice==1)
    {
        double sum = n1+n2;
        printf("Result:%.2lf\n",sum);
    }
      else if (choice==2)
      {
        double difference=n1-n2;
        printf("Result:%.2lf\n",difference);
      }
      else if (choice==3)
      {
        double product=n1*n2;
        printf("Result:%.2lf\n",product);
      }

      else if (choice==4)
      {
        if(n2 !=0){
        double quotient=n1/n2;
        printf("Result:%.2lf\n",quotient);
      }

    else
    {
        printf("Error: Division by zero is not allowed.\n");
    }
      }
    else
    {
        printf("Invalid choice. Please select number between 1 and 4.\n");
    }
}
```

Q3.

```
#include<stdio.h>
#define PI 3.14159
int main()
{
   int choice;
   float radius,result;

   printf("Menu:\n");
   printf("1. Calculate circumference of the circle\n");
   printf("2. Calculate area of the circle\n");
   printf("3. Calculate volume of the sphere\n");
   printf("Enter your choice(1-3):");
   scanf("%d", &choice);

   printf("Enter the radius");
   scanf("%f",&radius);

   if (choice==1)
   {
      result=2*PI*radius;
      printf("The circumference of the circle is: %.2f\n", result);
   }
   else  if (choice==2)
   {
      result=PI*radius*radius;
      printf("The area of the circle is: %.2f\n", result);
   }
    else  if (choice==3)
   {
      result=(4.0/3.0)*PI*radius*radius*radius;
      printf("The volume of the sphere is: %.2f\n", result);
   }
   else
   { printf("Invalid Choice!\n"); }
}
```

Q4.

```
#include<stdio.h>
int main()
{
   char letter;
  printf("Enter a character:");
   scanf("%c",&letter);
   //using switch statement
   switch (letter)
   {
   case'a':
   case'e':
   case'i':
   case'o':
   case'u':
   case'A':
    case'E':
    case'I':
   case'O':
   case'U':
      printf("The Entered Character is a Vowel.\n");
      break;
   default:
      printf("The Entered Character is not a Vowel.\n");
      break;
   }
   //using if-else conditional structure
   if(letter=='a'|| letter=='e'|| letter=='i'|| letter=='o'|| letter=='u'||
     letter=='A'|| letter=='E'|| letter=='I'|| letter=='O'|| letter=='U')
   {
   printf("The Entered Character is a Vowel.\n");
   }
   else {
   ("The Entered Character is not a Vowel.\n");
}
}
```

Q5.

```
#include<stdio.h>
int main()
{
   int month;
   // input month number from user
   printf("Enter month number(1-12):");
   scanf("%d", &month);
  //check the month number
   switch(month) {
   case 1:
    printf("January has 31 days.\n");    break;
   case 2:
      printf("February has 28 days.\n");   break;
   case 3:
      printf("March has 31 days.\n");   break;
   case 4:
      printf("April has 30 days.\n");   break;
   case 5:
      printf("May has 31 days.\n");    break;
   case 6:
      printf("June has 30 days.\n");    break;
   case 7:
      printf("July has 31 days.\n");    break;
   case 8:
      printf("August has 31 days.\n");    break;
   case 9:
      printf("September has 30 days.\n");    break;
   case 10:
      printf("October has 31 days.\n");  break;
   case11:
      printf("November has 30 days.\n");   break;
   case 12:
      printf("December has 31 days.\n");    break;
   default:
      printf("Invalid month number. Please enter a number between 1 and 12.\n");    break;
      }
}
```

PRACTICAL 05

Section A

Q1.

Using a while loop

```
#include<stdio.h>
int main()
{
   int number = 0;
   while (number<=100){
      printf("%d\n", number);
      number++;
   }
}
```

Using a Do While loop

```
#include<stdio.h>
int main()
{
   int number = 0;
   do {
      printf("%d\n", number);
      number++;
   } while (number<=100);
}
```

Using a For loop

```
#include<stdio.h>
int main()
{
   for(int number = 0; number<=100; number++)
    {
      printf("%d\n", number);
   }
}
```

Q2.

```
#include<stdio.h>
int main()
{
   int marks[10], total=0, i;
   float average;
   printf("Enter 10 marks:\n");
   //read the marks
   for(i=0;  i<10;  i++){
      printf("Mark %d:", i+1);
      scanf("%d", &marks[i]);
      total += marks[i];
}
   //calculating the average
   average=(float)total/10;

   printf("Total Marks:%d\n", total);
   printf("Average: %.2f\n",average);

   if (average<50){
      printf("Fail!\n");
   } else {
      printf("Pass!\n");
   }
}
```

Q3.

```
#include<stdio.h>
int main()
{
   int number,i;
   unsigned long long factorial=1;

   printf("Enter a positive integer:");
   scanf("%d",&number);

   if (number<0){
      printf("Error:Factorial is not defined for negative numbers.\n");
   }  else {
      for(i=1; i<=number; ++i)
      {
         factorial*=i;
      }
      printf("Factorial of %d =%llu\n", number, factorial);
   }
}
```

Q4.

```
#include<stdio.h>
int main()
{
   int number, digit, sum=0;
   printf("Enter a Number:");
   scanf("%d", &number);

   while (number>0) {
   //get the last digit
   digit = number %10;
   //add the digit to the sun
   sum += digit;
   //remove the last digit
   number/=10;
   }
   printf("Sum of digits:%d\n", sum);
}
```

Q5.

```
#include<stdio.h>
int main()
{
   int number, reversedNumber=0,remainder;
   printf("Enter a Number:");
   scanf("%d", &number);

   //Reversing the digits  of the number
   do{
      //Extracting the last digit
      remainder=number%10;
     //Bulding the reversed number
     reversedNumber*+remainder;
     //Removing the last digit
     number /=10;
      }
      while(number !=0);

   printf("Reversed number:%d\n",reversedNumber);
}
```

Q6.

```
#include<stdio.h>
int main()
{
   int base,exponent, result =1;
   printf("Enter the base:");
   scanf("%d", &base);
   printf("Enter the exponrnt");
   scanf("%d", &exponent);

   //calculate the power using a loop
   for(int i=1; i<=exponent; i++){
      result *= base;
   }
   printf("%d raised to the power of %d is %d\n", base,exponent,result);
   scanf("%d", &base);
}
```

Q7.

```
#include<stdio.h>
int main()
{
   int n=10;
   //number of Fibonacci numbers to be printed
   int first=0,second=1,next,i;
   printf("Fibonacci Series:");

   for( i=0; i<n ; i++)
   {
      if(i<=1)
         next=i;
      else{
         next=first+second;
         first=second;
         second=next;
      }
      printf("%d", next);
   }
}
```

Q8.

```
#include<stdio.h>
  int  isArmstrong(int number){
  int originalNumber, remainder,result=0,n=0;
  //store the original number in a separate variable
  originalNumber=number;
  //Count the number of digits
  while (originalNumber !=0){
     originalNumber /= 10;
     ++n;
  }
  //calculate the Armstrong number
  originalNumber=number;
  while (originalNumber !=0){
     remainder=originalNumber %10;
     result += pow(remainder,n);
     originalNumber /= 10;
  }
  //check if the number is Armstrong or not
  if(result==number)
     return 1;
  else
     return 0;
 }
  int main(){
  int number;
  printf("Enter a number:");
  scanf("%d", &number);

  if(isArmstrong(number))
     printf("%d is an Armstrong number.\n", number);
  else
     printf("%d is not an Armstrong number.\n", number);
}
```

Q9.

```
#include<stdio.h>
int main()
{
   char letter;
   printf("ASCII values fot letters A to Z:\n");
   for(letter='A'; letter <='Z'; letter++){
      printf("%c: %d\n", letter,letter);
   }
}
```

Q10.

```
#include<stdio.h>
int main()
{
   int rows;
   printf("Enter the number of rows:");
   scanf("%d",&rows);
   for(int i=1; i<=rows; i++){
         for(int j=1; j<=i; j++){
            printf("*");
         }
      printf("\n");
   }
}
```

Q11.

```
#include<stdio.h>
   int isPrime(int number){
   if (number <= 1){
      return 0;
   }
   for (int i=2; i*i<= number; i++){
      if(number % i==0){
         return 0;
      }
   }
   return 1;
}
int main()
{
   int number;
   printf("Enter a number:");
   scanf("%d", &number);

   if(isPrime(number)){
      printf("%d is a prime number.\n", number);
   }else{
       printf("%d is not a prime number.\n", number);

   }
}
```

Q12.

```
#include<stdio.h>
    void printFactors(int number){
      printf("Factors of %d:", number);
      for (int i=1; i<=number; i++)
      {
         if (number % i ==0){
           printf("%d", i);
         }
      }
      printf("\n");
    }
 int main() {
    int number;
    printf("Enter an integer:");
    scanf("%d", &number);

    printFactors(number);
 }
```

Q12.

```
#include<stdio.h>
int main(){
   int number, sum=0;
   printf("Enter numbers to add (enter -1 to stop):\n");
   while(1){
   scanf("%d", &number);
   if (number == -1)
      break;
   sum += number;
   }

   printf("sum: %d\n", sum);
}
```

Q13.

```
#include <stdio.h>
int main() {
    int array[10];
    int i;
    printf("Enter 10 integers:\n");
    // Read user inputs for the array
    for (i = 0; i < 10; i++) {
        printf("Enter element %d: ", i + 1);
        scanf("%d", &array[i]);
    }
    // Print the array
    printf("\nArray elements are: ");
    for (i = 0; i < 10; i++) {
        printf("%d ", array[i]);
    }
```

Q14.

```
#include <stdio.h>
int countEvenNumbers(int arr[], int size) {
    int count = 0;
    for (int i = 0; i < size; i++) {
        if (arr[i] % 2 == 0) {
            count++;
        }
    }
    return count;
}
int main() {
    int arr[] = {1, 2, 3, 4, 5, 6, 7, 8, 9, 10};
    int size = sizeof(arr) / sizeof(arr[0]);
    int evenCount = countEvenNumbers(arr, size);
    printf("The count of even numbers in the array is: %d\n", evenCount);
}
```

Section B

01.

```
#include <stdio.h>

int main() {
   int numbers[10];
   int positiveCount = 0, negativeCount = 0, zeroCount = 0;
   printf("Enter 10 numbers:\n");
   // Read the numbers
   for (int i = 0; i < 10; i++) {
      printf("Number %d: ", i+1);
      scanf("%d", &numbers[i]);
   }
   // Counting positive, negative,zero numbers
   for (int i = 0; i < 10; i++) {
      if (numbers[i] > 0)
         positiveCount++;
      else if (numbers[i] < 0)
         negativeCount++;
      else
         zeroCount++;
   }
   // Outputting the results
   printf("Positive numbers: %d\n", positiveCount);
   printf("Negative numbers: %d\n", negativeCount);
   printf("Zerores: %d\n", zeroCount);
}
```

02.

```c
#include <stdio.h>
int main() {
    int marks[10];
    int i, sum = 0;
    int max = 0, min = 100;
    printf("Enter the marks of 10 students:\n");

    // Read marks
    for (i = 0; i < 10; i++) {
        printf("Student %d: ", i + 1);
        scanf("%d", &marks[i]);
    // Update maximum, minimum marks
        if (marks[i] > max)
            max = marks[i];
        if (marks[i] < min)
            min = marks[i];
    // Calculate the sum of marks
        sum += marks[i];
    }

    // Calculate the average marks
    float average = (float)sum / 10;

    printf("\nMaximum marks: %d\n", max);
    printf("Minimum marks: %d\n", min);
    printf("Average marks: %.2f\n", average);
}
```

03.

```
#include <stdio.h>
int main() {
   int prices[10];
   int sum = 0;
   int count = 0;
 // Input prices
   printf("Enter the prices of 10 items:\n");
   for (int i = 0; i < 10; i++) {
      printf("Item %d: ", i + 1);
      scanf("%d", &prices[i]);
      sum += prices[i];
     if (prices[i] > 200) {
         count++;
      }
   }
 // Calculate & display average
   float average = (float) sum / 10;
   printf("\nAverage value of an item: %.2f\n", average);

 // Display count of items with price > 200
   printf("Number of items with price greater than 200: %d\n", count);

}
```

04.

```
#include <stdio.h>
int main() {
   int employeeNo, count = 0;
   float basicSalary;

    printf("Enter the employee number and basic salary (enter -999 to end):\n");

    while (1) {
      scanf("%d", &employeeNo);

      if (employeeNo == -999) {
         break;
      }

      scanf("%f", &basicSalary);

      if (basicSalary >= 5000) {
         count++;
      }
   }

   printf("Number of employees with basic salary >= 5000: %d\n", count);
}
```

05.

```
#include <stdio.h>
int main() {
   int employeeNumber[MAX_EMPLOYEES];
   int hoursWorked[MAX_EMPLOYEES];
   float overtimePayment[MAX_EMPLOYEES];
   int totalEmployees = 0;
   int overtimeExceeding4000 = 0;
     printf("Enter employee number (-999 to end): ");
   scanf("%d", &employeeNumber[totalEmployees]);
  while (employeeNumber[totalEmployees] != -999 && totalEmployees < MAX_EMPLOYEES) {
      printf("Enter hours worked for employee %d: ", employeeNumber[totalEmployees]);
      scanf("%d", &hoursWorked[totalEmployees]);
        // Calculate overtime payment
      if (hoursWorked[totalEmployees] > 40) {
         int overtimeHours = hoursWorked[totalEmployees] - 40;
         int normalHours = hoursWorked[totalEmployees] - overtimeHours;
         overtimePayment[totalEmployees] = (normalHours * OVERTIME_RATE) + (overtimeHours *
OVERTIME_RATE_EXTRA);
      } else {
         overtimePayment[totalEmployees] = 0;
      }
       if (overtimePayment[totalEmployees] > 4000) {
         overtimeExceeding4000++;
      }
        totalEmployees++;
       printf("Enter employee number (-999 to end): ");
      scanf("%d", &employeeNumber[totalEmployees]);
   }
    printf("\nEmployee\tOvertime Payment\n");
   for (int i = 0; i < totalEmployees; i++) {
      printf("%d\t\t%.2f\n", employeeNumber[i], overtimePayment[i]);
   }
   float percentageExceeding4000 = (float) overtimeExceeding4000 / totalEmployees * 100;
 printf("\nPercentage of employees whose Overtime Payment exceeds Rs. 4000: %.2f%%\n", percentageExceeding4000);
}
```