Class: B. Tech. 2nd Semester Branch: Computer Science and Engineering

Course Title: Computer Programming Course Code: ESC-201

Lab Exercise scheduled on 31/05/2025(ESC201.2)

1. ***Sequence Control Instruction***

```
#include <stdio.h>
int main()
    {
    printf("Step 1: Start\n");
    printf("Step 2: Process\n");
    printf("Step 3: End\n");
    return 0;}
```

2. **Decision-Making Statements**

```
#include <stdio.h>
int main()
{   int num = 10;
 if (num > 0)
{       printf("Number is positive.");
 }   return 0;}
```

if-else Statement

```
#include <stdio.h>
int main()
 {   int num = -5;
 if (num > 0)
 {       printf("Positive number.");    }
else {       printf("Negative number.");
  }
return 0;}
```

3. **switch-case Statement**

```
#include <stdio.h>
int main()
 {
     int choice = 2;
 switch (choice)
{       case 1:
      printf("Option 1 selected.");
 break;
  case 2:
     printf("Option 2 selected.");
break;
  default:
      printf("Invalid choice.");    }
return 0;}
```

4. Write a C program to find the sum of the individual digits of a positive integer.

```
#include <stdio.h>
int sumOfDigits(int num) {
   int sum = 0;
   while (num > 0) {
      sum += num % 10;  // Extract last digit and add to sum
      num /= 10;        // Remove last digit
   }
   return sum;
}
int main() {
   int num;
   printf("Enter a positive integer: ");
   scanf("%d", &num);
```

```
    printf("Sum of digits: %d\n", sumOfDigits(num));
    return 0;
}
```

5. **for Loop**

```
#include <stdio.h>
int main()
 {
 for (int i = 1; i <= 5; i++)
     {       printf("%d ", i);    }
  return 0;}
```

6. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.

```
#include <stdio.h>
void generateFibonacci(int n) {
    int a = 0, b = 1, next;
    printf("Fibonacci sequence: %d %d ", a, b);
    for (int i = 2; i < n; i++) {
        next = a + b;
        printf("%d ", next);
        a = b;
        b = next;
    }
    printf("\n");
}
int main() {
    int n;
    printf("Enter the number of terms: ");
    scanf("%d", &n);
    generateFibonacci(n);
    return 0;
}
```

7. Write a C program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.

```
#include <stdio.h>
int isPrime(int num) {
    if (num < 2) return 0;
    for (int i = 2; i * i <= num; i++) {
        if (num % i == 0) return 0;
    }
    return 1;
}
void generatePrimes(int n) {
    printf("Prime numbers up to %d: ", n);
    for (int i = 2; i <= n; i++) {
        if (isPrime(i)) printf("%d ", i);
    }
    printf("\n");
}

int main() {
    int n;
    printf("Enter the value of n: ");
    scanf("%d", &n);
    generatePrimes(n);
    return 0;
}
```

8. A character is entered through keyboard. Write a C program to determine whether the character entered is a capital letter, a small case letter, a digit or a special symbol using if-else and switch case.

The following table shows the range of ASCII values for various characters. Characters ASCII values A – Z 65 – 90 a – z 97 – 122 0 – 9 48 – 57 Special symbols 0 – 47, 58 – 64, 91 – 96, 123 – 127

```
#include <stdio.h>
void identifyCharacter(char ch) {
    if (ch >= 65 && ch <= 90)
        printf("Capital Letter\n");
    else if (ch >= 97 && ch <= 122)
        printf("Small Letter\n");
    else if (ch >= 48 && ch <= 57)
        printf("Digit\n");
    else
        printf("Special Symbol\n");
}

int main() {
    char ch;
    printf("Enter a character: ");
    scanf(" %c", &ch);  // Space before %c prevents issues with newline characters
    identifyCharacter(ch);
    return 0;
}
```

9. If cost price and selling price of an item is input through the keyboard, write a program to determine whether the seller has made profit or incurred loss. Write a C program to determine how much profit or loss incurred in percentage

```
#include <stdio.h>
void calculateProfitLoss(float cost, float selling) {
    float profitLoss = selling - cost;
    float percentage = (profitLoss / cost) * 100;
    if (profitLoss > 0)
        printf("Profit: %.2f%%\n", percentage);
    else if (profitLoss < 0)
        printf("Loss: %.2f%%\n", -percentage);
    else
        printf("No Profit, No Loss\n");
}
int main() {
    float cost, selling;
    printf("Enter Cost Price: ");
    scanf("%f", &cost);
    printf("Enter Selling Price: ");
    scanf("%f", &selling);
    calculateProfitLoss(cost, selling);
    return 0;
}
```