National University of Computer and Emerging Sciences



Laboratory Manual

for

Programming Fundamentals Lab

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| Section | BCS-1H1 & 1H2 |
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**Objectives**

The objectives of this lab are to cover the following:

* Nested If
* Switch Statement
* While Loop

**Question 1: Write a C+ program that read a character and check whether it is VOWEL or CONSONANT using Nested if. (5)**

**Question 2: Write a Calculator Program using the switch Statement. (5 marks)**

## Question 3: Let us see the C++ program to calculate the percentage of marks and show grade using the switch statements. (10 marks)

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| Percentage >= 90%: Grade APercentage >= 80%: Grade BPercentage >= 70%: Grade CPercentage >= 60%: Grade DPercentage >= 40%: Grade EPercentage < 40%: Grade F |
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**Question 4: Write a program in C++ to find the sum of the series 1 + 1/2^2 + 1/3^3 + ..+ 1/n^n. (10 marks)**

**Sample Output:**

**Input the value for nth term: 5**

**1/1^1 = 1**

**1/2^2 = 0.25**

**1/3^3 = 0.037037**

**1/4^4 = 0.00390625**

**1/5^5 = 0.00032**

**The sum of the above series is: 1.29126**

**Hint:** For taking power, 2 steps are required in the code:

● Import the library by

#include <cmath>

● Syntax for power: pow (base, exponent);

## Question 5: Write a program in C++ that prompts the user to enter two integers. The program must output how many numbers are multiples of 3 and how many are the multiples of 5 between the two integers. (10 marks)

## Question 6: Write a program in C++ that will calculate the Sum of Positive Numbers only using while loop and the loop breaks when the user enters a negative value. (5 marks)

## Question 7: Write a C++ program that generate Fibonacci sequence up to a certain number using while loop. (10 marks)

The Fibonacci sequence is a series where the next term is the sum of the previous two terms. The first two terms of the Fibonacci sequence is 0 followed by 1.

**The Fibonacci sequence: 0, 1, 1, 2, 3, 5, 8, 13, 21**

**Question 8: Write a C++ program that check leap year using Nested If? (5 marks)**

**Question 9: Write a C++ program to print the right angled triangle star pattern using for loop. (10 marks)**