National University

of Computer & Emerging Sciences Peshawar Campus

Name: _____ Roll No: _____

Program: BS (CS)
Semester: Spring – 2020
Time Allowed: 60 minutes
Course: Digital Logic Design (EL227)

Examination: Final Lab Exam
Total Weight: 40
Date: 24th July, 2020
Lab Instructor: Muhammad Yousaf

Note: There are a total of ten questions (1 - 10) and you need to solve *only one* of the following.

How to Choose Question: Figure out **last digit** of your Roll No and add **One** into it**, i.e.**

Roll No: p190005 => Last Digit = **5+1 = 6**, so this student will solve **Q#6** only.
Roll No: p190059 => Last Digit = **9+1 = 10**, so this student will solve **Q#10** only.
Roll No: p190020 => Last Digit = **0+1 = 1**, so this student will solve **Q#1** only.

Instructions:

- Student with **wrong selection** of question will be responsible
- Only Handwritten Solution on copy/paper/register is acceptable.
- There is no need of any tool/Logically software for today's exam.
- Late submissions on gmail/slack will be highly discouraged. Please don't embarrass me by making any kind excuses.

Submission: Upload Pics/Scan images of your handwritten solution on slate only.

Experiment No.1:

$$F = AB+A'BC+ABC'+ A'B'C+ A'B'C'$$

Implement the above function using **Decoder**. Draw its circuit diagram and truth table too.

Experiment No.2:

Design **T Flip-Flop** with **2-input NAND** gates only and check its functionality.

Experiment No.3:

Design a **BCD-to-Excess-3** code converter with a **BCD-to-decimal decoder** and **four OR** gates.

Experiment No.4:

$$F(w,x,y,z) = \sum(2,3,12,13,14,15)$$

Simplify through **K-Map** and implement the circuit diagram with **2-input NOR** gates only.

Experiment No.5:

F = AB+A'BC+ABC'

Draw the Truth Table and Circuit Diagrams of above Boolean Functions using Universal Gate (**NOR**) only.

Experiment No.6:

Design **Magnitude Comparator** of **4 bits** binary number just to check **A<B** and A=B relation of two numbers.

Experiment No.7:

F = AB+A'BC+ABC'+ A'B'C+ A'B'C'

Implement the above function using **De-Multiplexer**.

Experiment No.8:

F = AB+A'BC+ABC'+ A'B'C+ A'B'C'

Implement the above function using of **2-input NAND** gates only.

Experiment No.9:

Design a combinational circuit that generates the **9's complement** of a **BCD digit**.

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Experiment No.10:

F = AB+A'BC+ABC'+ A'B'C+ A'B'C'

Implement the above function using **Multiplexer**. Draw its circuit diagram and truth table too.