Digital Logic Design Practical's (CS302P)

Assignment # 02

Spring 2025

Total marks = 20

Deadline

23rd of June 2025

Please carefully read the following instructions before attempting the assignment.

RULES FOR MARKING

It should be clear that your assignment would not get any credit if:

- The assignment is submitted after the due date.
- The submitted assignment does not open, or the file is corrupted.
- Strict action will be taken if the submitted solution is copied from any other student or the internet.

You should consult the recommended books to clarify your concepts, as handouts are insufficient.

You are supposed to submit your assignment in Doc or Docx format.

Any other formats like scanned images, PDF, ZIP, RAR, PPT, BMP, etc. will not be accepted.

Topic Covered:

The objective of this assignment is to assess the understanding of students about:

- Lab Work - Week # 03 - Digital logic circuits analysis and converting Boolean expressions to digital circuits
- Lab Work - Week # 04 - Boolean Algebra and Simplification of Boolean Expressions
- Lab Work - Week # 05 - DE Morgan's Theory and the Universal Gates

Topic Covered

Lab Experiment # 01 to Lab Experiment # 05

NOTE

No assignment will be accepted *via email after the due date* (whether it is due to load shedding, internet malfunctioning, etc.). Hence, refrain from uploading assignments within the last hour of the deadline. It is recommended that the solution be uploaded at least two days before its closing date.

If you find any mistakes or confusion in the assignment (Question statement), please consult your instructor before the deadline. After the deadline, no queries will be entertained in this regard.

For any query, feel free to email me at:

CS302P@vu.edu.pk

Question No 01 **Marks (20)**

Analyze the provided circuit diagram, which demonstrates the implementation of an 8-to-1 Multiplexer using a 74151 integrated circuit:

- The circuit features four control inputs: **A, B, C, and D** *(A is Most significant Bit while the D is Least Significant Bit)***.**
- The output of interest is generated at **Pin 5 (Y)** of the 74151 IC and is connected to an **OUTPUT LED**.

Your task is to derive the simplified Boolean expression *(utilizing previously taught simplification techniques & tools in Electronics Workbench)*, that defines the conditions for a HIGH or valid output at the LED when A, B & C are at LOW state and D is undefined.

A	B	C	D	F
0	0	0	X	?

Hint: Draw the given circuit in Electronics Workbench, apply the input pattern of A, B & C and generate and share the Simplified Boolean Expression in MS Word File.

$$F(A, B, C, D) = ?$$