Kathmandu University Department of Electrical and Electronics Engineering DIGITAL ELECTRONICS LABORATORY EXPERIMENTS

LAB 3: Design and verification of simple Logic circuit using Primitive logic gates.

Components Required:

- IC 7404
- IC 7408
- IC 7432

- Bread board
- Resistor(1 ΚΩ)
- Light Emitting Diode

(LED)

PROBLEM

Synthesize the Logic to check if the traffic light is working properly or not using logic gates. Use the table given below to synthesize the circuit.

| R | Y | G | Condition (F) |
|--------------|------------|---|------------------------|
| 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 1 |
| 0 | 1 | 0 | 1 |
| 0 | 1 | 1 | 0 |
| reno1 | 0 | 0 | 1 |
| 1 | 0 | 1 | 0 |
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| ectol values | 1 1 1 1 | 1 | los such a m 0 |

F=1 implies stop-light is working correctly

F=0 implies stop-light is busted.

Students are requested to follow the design procedure as outlined.

- Simplify the given truth-table using Boolean Algebra.
- Draw the circuit Diagram using appropriate logic gates.
- Synthesize the circuit in Bread-Board.
- Verify the truth table.

| Note: Use the primitive gates i.e. AND, OR and NOT to implement the logic) | |
|---|--------|
| Expression for the given Design Problem: | |
| Draw the circuit Diagram using appropriate logic gates in space provided. | gitate |
| Show the logic diagram as well. | |
| Can the circuit be implemented with either or all of AND-NOR, NAND-AND, OR NAND-NO implementation. If yes, draw the equivalent circuit. | MEOR |
| The circuit, the necessary theory for that particular implementation, the required truth table and its rification should be incorporated in the report as well. | , |