

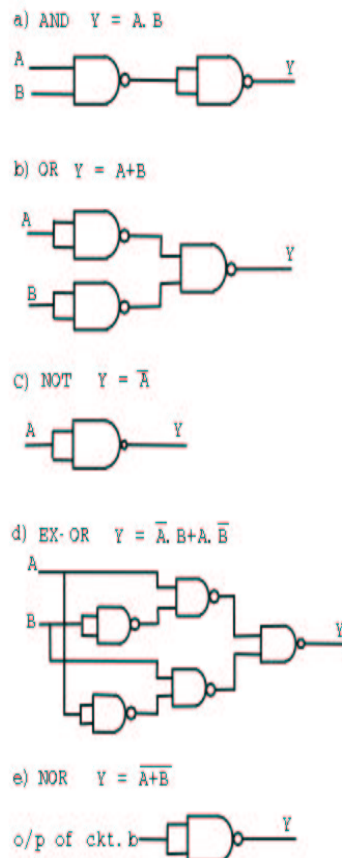
DIGITAL LOGIC DESIGN

Laboratory Exercise # 4

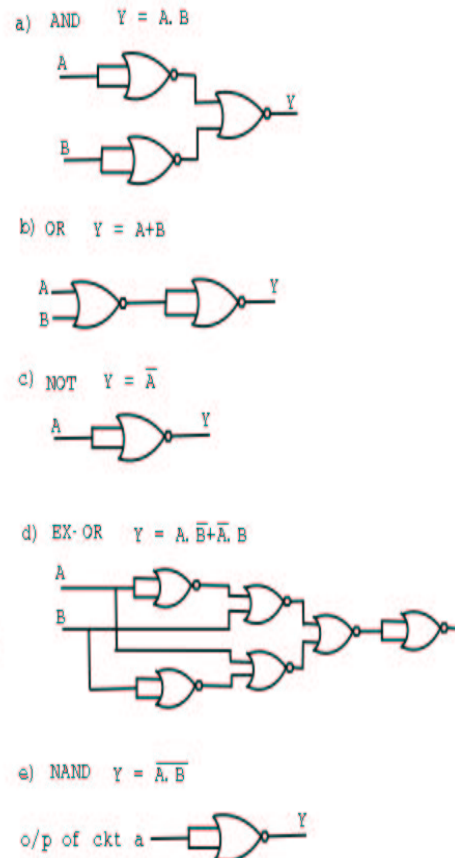
TITLE	UNIVERSAL GATES
AIM	To study the realization of basic gates using universal gates (NAND & NOR).
APPARATUS	Power Supply, Breadboard.
COMPONENTS	ICs 7400 (quad 2-input NAND gate), 7402 (quad 2-input NOR gate), DIP Switch, LED.

CIRCUIT DIAGRAM

Using NAND



Using NOR



DIGITAL LOGIC DESIGN

THEORY

AND, OR, NOT are called basic gates as their logical operation cannot be simplified further.

NAND and NOR are called universal gates as using only NAND or only NOR any logic function can be implemented. Using NAND and NOR gates and De-Morgan's Theorems different basic gates & EX-OR gates are realized.

PROCEDURE

- 1) Give biasing to the IC and do necessary connections as shown in the circuit diagram.
- 2) Give various combinations of inputs and notedown output using LED.
- 3) Repeat the procedure for all gates.

OBSERVATION TABLE

A	B	Y
0	0	
0	1	
1	0	
1	1	

CONCLUSION Thus universal gates are studied.