

VLSI Lab

LABORATORY MANUAL

Spring 2019



LAB 13

Title of Lab Experiment: Simulation and Testing of basic digital designs on transistor level using Dynamic CMOS Technology on S-Edit

Engr. Rashid Karim

STUDENT NAME

ROLL NO

SEC

LAB ENGINEER SIGNATURE & DATE

MARKS AWARDED: /10

**NATIONAL UNIVERSITY OF COMPUTER AND EMERGING SCIENCES (NUCES),
ISLAMABAD**

Prepared by: Engr. Furqan Mehmood

Version: 2.00

Last Edited by: Engr. Aneela Sabir

Date: 23rd April, 2019

LAB: 13 Simulation and Testing of basic digital designs on transistor level using Dynamic CMOS Technology on S-Edit

Verified by: Engr. Rashid Karim.

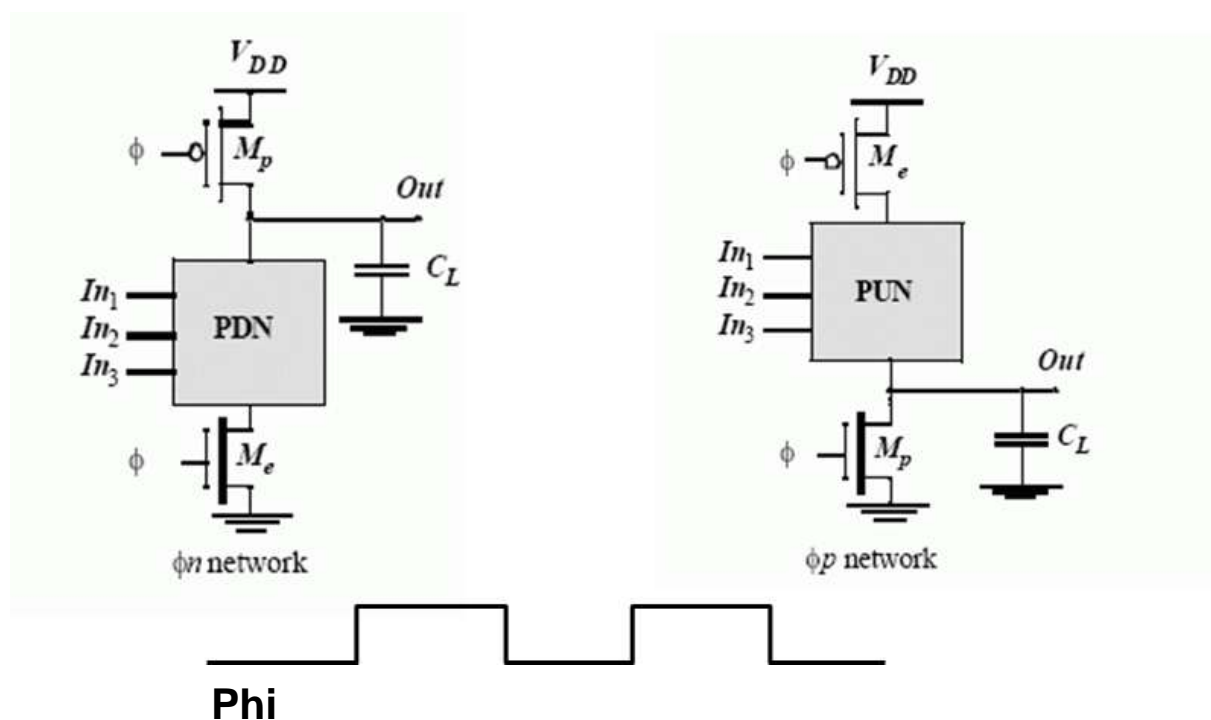
1- Learning Objectives:

Simulation and Testing of basic digital designs on transistor level using Dynamic CMOS Technology on S-Edit

2- Equipment Required:

Software: S-Edit

3- Dynamic CMOS logic



4- Task:

Implement the following designs on transistor level using S-Edit tool and verify their functionality by drawing the waveforms.

- (i) $F' = AB + C + DE + F$
- (ii) $X' = A + B + C.(GHI + JK)$
- (iii) $Y = (ABC + DEF)'.G'H' + I'$

Submission Declaration by the Student:

In submitting this lab write-up to the Lab Engineer/Instructor, I hereby declare that:

- ☐ I have performed all the practical work myself
- ☐ I have noted down actual measurements in this write up from my own working
- ☐ I have written un-plagiarized answers to various questions
- ☐
- ☐ I have/have not obtained the desired objectives of the lab.

Reasons of not obtaining objectives (if applicable):

Student's signature and Date

Student Evaluation by the Lab Engineer:

The Lab Engineer can separate this page from the writeup and keep it for his/her own record. It must be signed by the student with date on it.

- ☐ **Lab Work:** objectives achieved (correctness of measurements, calculations, answers to questions posed, conclusion)
_____/30
- ☐ **Lab Writeup:** Neatness, appropriateness, intime submission
_____/10
- ☐ **Troubleshooting:** Were the student able to troubleshoot his/her work when it was purposely changed?
_____/10
- ☐ **TOTAL:**
_____/50

Feedback on student behaviour:

Encircle your choice. -2 means poorest/worst/extremely inadequate/irrevlevant, 0 gives an average score, and +2 means best/most relevant/most adequate.

- ☐ Did the student join the lab at the start/remained in lab? -2 -1
0 1 2
- ☐ Did the student remain focused on his/her work during lab? -2 -1
0 1 2
- ☐ Rate student's behaviour with fellows/staff/Lab Engineer? -2 -1
0 1 2
- ☐ Did the student cause any distraction during the Lab? -2 -1
0 1 2

☐ Was the student found in any sort of plagiarism?

-2 -1

0 1 2

Additional comments (if any) by the Lab Engineer:

Lab Engineer's signature and Date

Student's feedback: [Separate this page; fill it; drop in the Drop Box.]

- ☐ Providing feedback for every lab session is optional. No feedback means you are satisfied
- ☐ The Lab Committee will consider only duly filled forms submitted within one week after the lab
- ☐ This feedback is for LAB session:
- ☐ LAB Number: _____,
- ☐ Date: _____
- ☐ General (to provide feedback on a persistent practice/occurrence in LABs).
- ☐ Your current CGPA is in the range 4.00 to 3.00/2.99 to 2.00/1.99 to 1.00/0.99 to 0.00

This feedback is:

- ☐ For a Particular
- ☐ Who conducted the LAB?

- ☐ Actual Start time: _____
- ☐ Total Duration of Lab: _____
- ☐ Instruction Duration: _____
- ☐ Practical Duration: _____
- ☐ LAB writeup available before LAB? Yes/No with the Photocopier/in LAB/in SLATE
- ☐ Had the theory related to lab been covered in theory class? Yes/No

Simulation and Testing of basic digital designs on transistor level using Dynamic CMOS Technology on S-Edit	LAB:13
--	---------------

Encircle your choice. -2 means poorest/worst/extremely inadequate/irrelevant, 0 gives an average score, and +2 means best/most relevant/most adequate.

Instruction Session	Was duration of instruction session adequate?	-2	-1	0	+1	+2
	How much did you understand about the practical?	-2	-1	0	+1	+2
	How much content was irrelevant to the practical?	-2	-1	0	+1	+2
	Did the instructor allowed Q/A and discussion?	-2	-1	0	+1	+2
Practical	Did you get sufficient time for practical?	-2	-1	0	+1	+2
Lab Engineer	Presence in lab at all time?	-2	-1	0	+1	+2
	Ability to convey?	-2	-1	0	+1	+2
	Readiness to help during practical?	-2	-1	0	+1	+2
	Readiness to discuss theoretical aspects?	-2	-1	0	+1	+2
	Helps in troubleshooting?	-2	-1	0	+1	+2
Staff	Guides hows & whys of troubleshooting?	-2	-1	0	+1	+2
	How friendly was the lab staff?	-2	-1	0	+1	+2
	Presence of staff throughout the lab session?	-2	-1	0	+1	+2
Equipment	Impact of availability of staff on your practical?	-2	-1	0	+1	+2
	Performance of Electronic Instruments?	-2	-1	0	+1	+2
	Performance of Breadboard/experiment kit?	-2	-1	0	+1	+2
Overall	Performance of circuit components esp. ICs?	-2	-1	0	+1	+2
	Your overall rating for the whole lab session?	-2	-1	0	+1	+2

Other comments:
