Printed Pages: EEC027

(Following Paper ID and Roll No. to be filled in your Answer Books)											
PAPER ID:	Roll No.										

B.TECH

Theory Examination (Semester-VI) 2015-16

VLSI DESIGN

Time: 3 Hours Max. Marks: 100

SECTION-A

- 1. Attempt all parts. All parts carry equal marks. Write answer of each part in short. $(2 \times 10 = 20)$
 - a. What are the different MOS layers?
 - b. Define rise time and fall time.
 - c. What is body effect coefficient?
 - d. How do you prevent Latch up problem?
 - e. Write a note on CMOS transmission gate logic.
 - f. List any two types of layout design rules.
 - g. What is DIBL?
 - h. Write an equation for combinational zero controllability and combinational one controllability for two input AND gate.
 - i. List the design guidelines for I_{DDO} testing.
 - j. Draw an structure of Transmission Gate.

SECTION-B

Attempt any **five** questions from this section.

 $(10 \times 5 = 50)$

- 2. Derive drain current of MOS device in different operating regions.
- 3. Size the transistors of CMOS three input NAND gate for logic ratio of 3/1.
- 4. Explain in detail Standard Cell Based Design ASICs
- 5. Enlist the main features of the following

(i)PLA (ii)ASIC WWW.UPTUNOTES.COM

- 6. Explain Built-in Self-Test.
- 7. Derive the expression for Dc characteristics of CMOS inverter.
- 8. Explain in detail about various types of Routing.

9. Discuss the principle of constant field scaling and also write its effect on device characteristics

SECTION-C

Attempt any two questions from this section.

 $(15 \times 2 = 30)$

10.

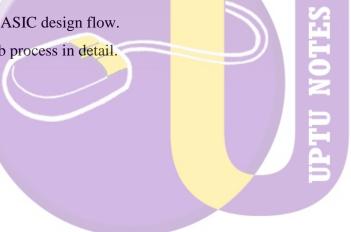
- a) Calculate the threshold voltage for a transistor at 300K for a process with a Si substrate with NA-1.80′1016, a Sio2 gate oxide with thickness 200Å. Assume fms=-0.9V;Qfc=0.
- b) Explain lambda based design rules

11.

- a) Explain the gate, source/drain formation and isolation steps of CMOS fabrication process with neat diagrams.
- b) Implement the following function using CMOS f(A,B,C)=A'BC+AB'C+ABC'

12.

- a) Explain neatly the ASIC design flow.
- b) Describe Twin-Tub process in detail.



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