

Code No: RT41041

**R13**

**Set No. 1**

IV B.Tech I Semester Supplementary Examinations, February/March - 2018

**VLSI DESIGN**

(Common to Electronics and Communication Engineering and Electronics and Instrumentation Engineering)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part-A and Part-B*

*Answer ALL sub questions from Part-A*

*Answer any THREE questions from Part-B*

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**PART-A (22 Marks)**

1. a) When the channel is said to be pinched –off? [3]
- b) What are the different MOS layers? [4]
- c) Give the different scaling models and scaling factors? [3]
- d) State the disadvantages of dynamic CMOS logic? [4]
- e) What are the different levels of design abstraction at physical design? [4]
- f) What information from the targeted FPGA device is required in RTL synthesis? [4]

**PART-B (3x16 = 48 Marks)**

2. a) With neat sketches explain the CMOS n-well fabrication process indicating the masks used. [8]
- b) What is threshold voltage of a MOS device and explain its significance. [8]
3. a) Discuss CMOS design style. Compare with nMOS design style? [8]
- b) Design a stick diagram for two input nMOS NAND and NOR gates? [8]
4. a) Why scaling is required? Write the scaling factors for different types of device parameters? [8]
- b) Discuss the limits due to sub threshold currents. [8]
5. a) Describe constructional features and performance characteristic of Pseudo-NMOS logic. [8]
- b) Explain two-phase clock generator using D flip-flops and draw the corresponding waveforms. [8]
6. a) Write down the comparisons between Field Programmable Gate Array and Application Specific Integrated Circuit in detail. [8]
- b) Give the steps in ASIC design flow with flow diagram and briefly discuss about each step. [8]
7. a) Write down the step by step approach of FPGA design process on XILINX environment? [8]
- b) Design a queue and write the dataflow style VHDL program for the same. [8]