Question Paper

Exam Date & Time: 06-Feb-2021 (02:00 PM - 05:15 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

MANIPAL SCHOOL OF INFORMATION SCIENCES, MANIPAL
FIRST SEMESTER MASTER OF ENGINEERING- ME (VLSI DESIGN / EMBEDDED SYSTEMS(SCSU,USA)) DEGREE EXAMINATION - FEBRUARY 2021

Digital Systems and VLSI Design [EDA 602]

Marks: 100 **Duration: 180 mins.**

SATURDAY, FEBRUARY 6, 2021

Answer all the questions.

1)	Explain **Czochralski (CZ)** method of crystal growth with relevant figures. (TLO 4.1)	(10)
2)	a) Briefly give the basic structure of Amorphous materials, Polycrystals and Single crystals. b) Write short notes on crystal defects. (TLO 4.2)	(10)
3)	Explain **twin tub process** with neat diagrams. (TLO 4.3)	(10)
4)	Explain the concept of ***holes*** and ***islands*** in patterning. What are the basic photoresist components and their roles in the process? (TLO 5.1)	(10)
5)	Differentiate among pass transistor, transmission gate and gate (restoring) logic. (TLO 1.1)	(10)
6)	Design a CMOS single bit full adder. Using this adder, explain how do you construct a magnitude comparator circuit? (TLO 2.1)	(10)
7)	State and prove the theorem specifying the condition for zero short-circuit power consumption in a CMOS gate. (TLO 2.2)	(10)
8)	Design the gates with the following logic functions and T-size them. Present the resulting transistor sizes in a table form using all the 3 techniques. (TLO 3.1) a) Z = [(A.B + C.D).E]' b) Z = [(A + B).C + D]'	(10)
9)	a) What are design rules? Compare ***lambda-based*** and ***micron-based*** design rules. b) What are stick diagrams? How are they helpful in physical layout? Explain. (TLO 5.1)	(10)
10)	a) Explain briefly, the CMOS domino logic with an example. How can this be converted into a static one? b) What is a C^2MOS logic? Explain with a neat diagram. (TLO 3.3)	(10)

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