Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2160709 Date:21/05/2019

Subject Name:Embedded & VLSI Design

Time:10:30 AM TO 01:00 PM Total Marks: 70

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1	**(a)**	Give classifications of embedded systems in brief.	**03**
	(b)	Explain depletion region of nMOS.	**04**
	(c)	What is EDLC? Explain different phases of Embedded product Development life cycle.	**07**
Q.2	**(a)**	Explain Embedded firmware.	**03**
	(b)	Explain watch dog timer and real time clock in brief.	**04**
	(c)	Explain the fundamental issues of hardware software co-design in brief.	**07**
		OR	
	(c)	Explain overview of VLSI design methodologies.	**07**
Q.3	**(a)**	What do you mean by sensors and actuators?	**03**
	(b)	Explain the concept of modularity and locality in brief.	**04**
	(c)	Explain fabrication steps of nMOS in detial	**07**
		OR	
Q.3	**(a)**	What do you mean by RISC processor? Explain in brief.	**03**
	(b)	Compare full custom and semi custom design.	**04**
	(c)	What is GCA (Gradual Channel approximation)? Derive current voltage equations of MOS transistor.	**07**
Q.4	**(a)**	Explain the operation of two-input depletion load NOR gate.	**03**
	(b)	Explain operation of CMOS inverter.	**04**
	(c)	Explain resistive load inverter and derive its critical voltage points	**07**
		OR	
Q.4	**(a)**	Explain controllability and observability.	**03**
	(b)	Explain behavior of bistable elements in brief..	**04**
	(c)	Explain operation of CMOS transmission gates (TGs) in detail.	**07**
Q.5	**(a)**	What is UML (unified modeling language). Explain in brief.	**03**
	(b)	Explain clock generation and distribution techniques.	**04**
	(c)	What is the need for voltage bootstrapping? Explain dynamic voltage bootstrapping circuit with necessary mathematical analysis.	**07**
		OR	
Q.5	**(a)**	What is significance of threshold voltage in MOS transistor? Write expression of threshold voltage.	**03**
	(b)	Explain Built in self test (BIST) method in detail.	**04**
	(c)	Explain NAND gate using CMOS realization, pass transistor and Complementary pass transistor realization.	**07**

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