Seat No.: _____ **Enrolment No._____**

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–VI (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2160709 **Date: 08/05/2017**

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		**Short Questions.**	**14**
	1	Define Embedded Systems.	
	2	What is the function of an Operating System?	
	3	What is the minimum number of interface lines required for implementing I2C interface?	
	4	Which material is used for gate oxide in MOS?	
	5	What is the purpose of Brown-out protection circuit?	
	6	Which MOSFET is used in pass transistor logic?	
	7	Define Firmware.	
	8	Define Body Effect in MOS.	
	9	What is FLASH memory?	
	10	Define Noise Margin.	
	11	What is the maximum number of USB devices that can be connected to USB Host? [1] Unlimited [2] 128 [3] 127 [4] None of these	
	12	Write I-V equation for nMOS in saturation.	
	13	How many address lines are required to interface 32 KB memory?	
	14	What is the significance of Interrupt?	
Q.2	**(a)**	Classify Embedded systems along with their applications.	**03**
	(b)	State the difference between CISC and RISC processors.	**04**
	(c)	Explain VLSI Design flow using Y-chart.	**07**
		OR	
	(c)	Explain the concept of Static Memory (SRAM) Cell. Also explain the merits and limitation of SRAM and DRAM as Random Access Memory.	**07**
Q.3	**(a)**	Explain different types of processors used in Embedded systems.	**03**
	(b)	Explain various communication interfaces used in Embedded Systems.	**04**
	(c)	Explain NAND gate using CMOS realization, pass transistor and Complementary pass transistor realization.	**07**
		OR	
Q.3	**(a)**	What is difference between Harvard and Von-Neumann Architecture?	**03**
	(b)	Derive equation of V_{OL} and V_{OH} for n-type MOSFET inverter with resistive load.	**04**
	(c)	Write a short note on EDLC.	**07**
Q.4	**(a)**	What is UML? Explain in brief.	**03**
	(b)	Explain the concept of 1. Watchdog Timer 2. Real-Time Clock	**04**
	(c)	Explain the fabrication steps of nMOS transistor with necessary figures.	**07**
		OR	
Q.4	**(a)**	Classify Embedded system memories.	**03**
	(b)	Derive threshold voltage equation for n-channel MOSFET.	**04**

	(c)	Define Controllability and observability. List out electrical and logical faults observed in circuit.	**07**
Q.5	**(a)**	Describe MOS System under external bias.	**03**
	(b)	Explain BIST techniques.	**04**
	(c)	Define sequential circuits and implement CMOS clocked JK latch.	**07**

OR

Q.5	**(a)**	Explain Latch up problem in CMOS inverter in brief.	**03**
	(b)	What is Actuator? Explain its role in Embedded System design using suitable example.	**04**
	(c)	Explain different operation modes of MOS with figures.	**07**

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