

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	04
	1. Watchdog Timer	
	2. Real-Time Clock	
	(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**
