Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– V (New) EXAMINATION – WINTER 2019

Subject Code: 2152409 **Date: 21/11/2019**

Subject Name: Microcontroller for Power Electronics

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.**

			MARKS
Q.1	**(a)**	Explain in brief: EEPROM, EPROM, DRAM	**03**
	(b)	Draw the block diagram of microcontroller 8051.	**04**
	(c)	Differentiate between microcontroller and microprocessor.	**07**
Q.2	**(a)**	State important criterion for the selection of microcontroller.	**03**
	(b)	Explain the architecture of 8085 microprocessor.	**04**
	(c)	Write an ALP to generate a control signal on P1.5 to operate a buck converter at 10kHz with 25% duty cycle. Assume crystal frequency of 12MHz. Write appropriate comments for each step.	**07**
		OR	
	(c)	Calculate the time delay in the following code assuming a crystal frequency of 12MHz and machine cycle as given in bracket: DELAY: MOV R3,#100; (1) HERE: NOP; (1) NOP; (1) NOP; (1) NOP; (1) NOP; (1) DJNZ R3,HERE (2) RET (2)	**07**
Q.3	**(a)**	Explain the meaning of following 8051 instructions with an example: CPL, DJNZ, SETB	**03**
	(b)	Explain TMOD register.	**04**
	(c)	What is an assembler? State 5 assembler directives of 8051. Explain any two.	**07**
		OR	
Q.3	**(a)**	Explain the meaning of following 8051 instructions with an example: MOV, MOVC, MOVX	**03**
	(b)	Write an ALP to multiply two 1-digit BCD numbers stored in R3 and R4 using repetitive addition method. Store the result in R0.	**04**
	(c)	List and explain I/O ports of 8051 and their functions. Also, state which ports are internally pulled up at 5V through resistors.	**07**
Q.4	**(a)**	Calculate the time of one machine cycle of 8051 microcontroller if a crystal of 18MHz is connected to it.	**03**
	(b)	Write a program to blink LEDs connected at port 1 continuously with some specific delay.	**04**
	(c)	Explain different addressing modes of 8051 with example.	**07**
		OR	
Q.4	**(a)**	What is the function of interrupts in 8051? List various interrupts available in 8051.	**03**
	(b)	What do you mean by stack? Explain in brief w.r.t 8051.	**04**
	(c)	Discuss PSW register in detail.	**07**
Q.5	**(a)**	What is a subroutine in 8051? Explain in brief with a suitable short example.	**03**

	(b)	Draw flowchart to interface seven segment display with 8051.	**04**
	(c)	State various types of Jump and Loop instructions. Explain any three with examples.	**07**

OR

Q.5	**(a)**	Write appropriate comments to explain the function carried out by following program segment ORG 0x0300 SETB PSW.4 SETB PSW.3 MOV 0x18,#0xFF XRL A,R0 INC A END	**03**
	(b)	State the similarities and differences between following instructions. ADD A, @R1 and ADD A, R1	**04**
	(c)	How to interface a 4 x 4 key board with 8051? Draw circuit diagram and flowchart describing the programming logic.	**07**

****