

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:	07
	DELAY: MOV R3,#100; (1)	
	HERE: NOP; (1)	
	NOP; (1)	
	NOP; (1)	
	NOP; (1)	
	NOP; (1)	
	DJNZ R3,HERE (2)	
	RET (2)	
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 **03**
ORG 0x0300
SETB PSW.4
SETB PSW.3
MOV 0x18,#0xFF
XRL A,R0
INC A
END
(b) State the similarities and differences between following instructions. **04**
ADD A, @R1 and ADD A, R1
(c) How to interface a 4 x 4 key board with 8051? Draw circuit diagram and flowchart describing the programming logic. **07**

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