GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) EXAMINATION – SUMMER 2024

Subject Code: 3152409   **Date:31-05-2024**
Subject Name: Microcontrollers Architecture, Interefacing and Applications
Time:02:30 PM TO 05:00 PM   **Total Marks:70**
Instructions:
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**
4. **Simple and non-programmable scientific calculators are allowed.**

			MARKS
Q.1	(a)	With neat diagram explain PSW register.	03
	(b)	Draw the block diagram of microcontroller 8051.	04
	(c)	Explain importance of PSW register with its each bit significance.	07
Q.2	(a)	Define bits of SCON & TCON registers.	03
	(b)	Define the terms: address bus, data bus and control bus.	04
	(c)	Explain SFR (Special Function Register) and PSW (Program Status Word).	07
		OR	
	(c)	Write a program to generate a control signal on P 0.5 to operate a buck converter at 1kHz with 25% duty cycle. Assume crystal frequency of 12MHz.	07
Q.3	(a)	State important criterion for the selection of microcontroller.	03
	(b)	Explain difference between ADD and ADDC instructions.	04
	(c)	Write a program to generate an output as a square wave with a frequency of 5 Hz at P2.2 pin of 8051. Assume that the crystal frequency is 12MHz.	07
		OR	
Q.3	(a)	Give comparison of microcontroller and microprocessor.	03
	(b)	Explain MUL instruction with example.	04
	(c)	Write a program to Toggle all the LEDs ON and OFF (Blinking LEDs) with a frequency of 10 Hz that are connected to PORT 01 of the 8051 Microcontroller. Take crystal frequency of 12 Mhz.	07
Q.4	(a)	What is the function of interrupts in 8051? List various interrupts available in 8051.	03
	(b)	Why delay are required in programming?	04
	(c)	Explain different addressing modes of 8051 with example.	07
		OR	
Q.4	(a)	What do you mean by stack? Explain in brief w.r.t 8051.	03
	(b)	Write a brief note on DAC.	04
	(c)	Draw internal block diagram of 8051. State 8051 pins used while interfacing with external program memory.	07
Q.5	(a)	What is assembler directive? State any 3 assembler directives.	03
	(b)	State the similarities and differences between following instructions. ADD A, R1 and ADD A, @R1	04
	(c)	State various types of Jump and Loop instructions. Explain any three with examples.	07

OR

Q.5 **(a)** Draw schematic diagram of 4 to 1 multiplexer.   **03**

(b) Explain any two arithmetic instruction of 8051.   **04**

(c) Draw internal architecture of 8051 microcontroller. Discuss function of each block   **07**
in detail.

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