GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–V (NEW) - EXAMINATION – SUMMER 2017

Subject Code: 2150306   **Date: 03/05/2017**
Subject Name: Microcontroller & interfacing
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.**

			MARKS
Q.1		**Short Questions**	**14**
	1	Where does the 8051 wake up when it is powered up?	
	2	Explain PSW register.	
	3	A given 8051 has 1FFFH as the address of its last location of on-chip ROM. What is the size of on-chip ROM?	
	4	How many bytes are used by the following? DATA_1: DB "BRAZIL"	
	5	Give the size of the on-chip ROM in each of the following: (a) 8051, (b) 8052, (c) 8031	
	6	All conditional jumps are short jumps, meaning that the address of the target must be within ___ bytes of the contents of the program counter.	
	7	Registers _ and _ are the only registers that can be used for pointers in register indirect addressing mode.	
	8	Write instructions see whether bit D0 of R3 is high or low.	
	9	Which flags are affected by the multiply and divide instructions?	
	10	The 8051 is a _____ bit microcontroller.	
	11	What is the importance of TF1 bit of TCON register?	

	12	MOV A,#56H
		MOV R1,#50H
		MOV 50H,#45H
		XCHD A,@R1
		What is the result at A and R1?	

	13	After reset, SP register is initialized to address ____	
	14	What are line drivers such as MAX232 used for?	
Q.2	**(a)**	State the difference between microcontroller & microprocessor.	**03**
	(b)	Explain in detail register and indexed addressing modes with examples.	**04**
	(c)	Discuss about data types and directives available in 8051 microcontroller.	**07**

OR

	(c)	Write an assembly program to check if the character string 'ROTATOR', stored in RAM locations 45H onwards is a palindrome. If it is, glow led connected to pin P1.0.	**07**

Q.3	(a)	Why does PORT 0 need pull up registers?	03
	(b)	Write an assembly program to get the status of P1.2 and put it on P1.3.	04
	(c)	Explain in detail compare and logic instructions in 8051 microcontroller.	07

OR

Q.3	(a)	What is checksome byte in ROM? How can we calculate it?	03
	(b)	Write down the steps for mode 1 programming and explain with its logic diagram.	04
	(c)	Draw architecture of 8051 microcontroller and explain in detail.	07

Q.4	(a)	What is the role of GATE bit in TMOD register?	03
	(b)	Explain baud rate in 8051.	04
	(c)	Write a note on DS12887 RTC chip.	07

OR

Q.4	(a)	Explain the concept of signed number in computers? How it is important?	03
	(b)	Write a short note on Semiconductor Memory and its classifications.	04
	(c)	Draw and explain the interfacing of stepper motor with 8051 microcontroller. Define the terms: stepper motor, step angle, steps per revolution.	07

Q.5	(a)	For DAC0808, what is the analog output voltage if the digital input is 01100100 B, I_{ref} = 2mA, across 5Kohm.	03
	(b)	Draw the connection showing interfacing of 16K×8 Data RAM to 8051.	04
	(c)	Design a counter for counting the pulses of an input signal. The pulses to be counted are fed to pin P3.4. XTAL = 22 MHz.	07

OR

Q.5	(a)	Give pin descriptions of : ALE, PSEN, EA	03
	(b)	What is interrupt in 8051 microcontroller? How will you set its priority with IP register?	04
	(c)	How will you measure the temperature? Draw connection of temperature sensor with 8051 microcontroller and explain the necessary details.	07

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