Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER–VII (NEW) EXAMINATION – WINTER 2020

Subject Code: 2172001 **Date:19/01/2021**

Subject Name: Microcontrollers and Embedded Systems

Time:10:30 AM TO 12:30 PM **Total Marks: 56**

Instructions:

1. **Attempt any FOUR questions out of EIGHT questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

			MARKS
Q.1	**(a)**	Draw block diagram of a generalized embedded system.	**03**
	(b)	Describe the challenges faced in Embedded system design.	**04**
	(c)	Write a note on serial interface protocols (i) I^2C (ii) SPI	**07**
Q.2	**(a)**	How can one access code ROM space in 8051?	**03**
	(b)	Define checksum byte. Why is checksum operation performed & how?	**04**
	(c)	Draw & explain RS-232 connections to Atmel 8051.	**07**
Q.3	**(a)**	Explain the bits of TCON SFR that are related to interrupts.	**03**
	(b)	Draw a neat interfacing diagram of ADC0848 with Atmel 8051.	**04**
	(c)	An external pulse train is connected to pin T0. WAP in C to display the count on ports P1 & P2.	**07**
Q.4	**(a)**	Enlist the types of interrupts in 8051 with priority & vector address.	**03**
	(b)	WAP in C to convert BCD to decimal & display the value on ports P1, P2 & P3.	**04**
	(c)	WAP in C to rotate stepper motor in an 8-step sequence.	**07**
Q.5	**(a)**	Explain the instructions related to subroutines in PIC18F4xx.	**03**
	(b)	Explain PORTA functions of PIC18F4xx.	**04**
	(c)	Interface 7-segment display with PIC18F4xx.	**07**
Q.6	**(a)**	Differentiate between SFR, FSR & BSR.	**03**
	(b)	Enlist & explain the addressing modes of PIC18F4xx with examples.	**04**
	(c)	How can data be transferred from program memory to data memory in PIC18F4xx? Illustrate with an example.	**07**
Q.7	**(a)**	Explain bit configuration of T0CON SFR of PIC18F4xx.	**03**
	(b)	State the machine control instructions.	**04**
	(c)	Write an ALP to generate a square wave of 10kHz on RC0 port pin, given clock frequency of 40MHz.	**07**
Q.8	**(a)**	State the name & function of SFRs related to I/O ports in PIC18F4xx.	**03**
	(b)	Explain the bit pattern of IPR1 & PIE1 SFRs of PIC18F4xx.	**04**
	(c)	An array of 10 data is stored at addresses beginning from 0x100 in PIC18F4xx. Write an ALP to square those numbers & store them at addresses beginning from 0x120.	**07**

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