Seat No.: _____ Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY

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

Subject Code:3150306 **Date:29/01/2021**

Subject Name:Microcontroller Programming & Interfacing

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)**	Enlist Characteristic of Embedded system	**03**
	(b)	Compare Block diagram of Microprocessor and Microcontroller.	**04**
	(c)	Draw and discuss Architecture of 8051µC.	**07**
Q.2	**(a)**	Discuss Criteria for selecting Microcontroller.	**03**
	(b)	Explain Working of PORT0 of 8051µC.	**04**
	(c)	Differentiate and explain between different Addressing modes of 8051µC.	**07**
Q.3	**(a)**	Draw Crystal Oscillator interfacing with ATMEGA 32 µC, Provide Capacitor values for different frequencies.	**03**
	(b)	Treat registers R0 and R1 as 16 bit registers, and rotate them one place to the left; bit 7 of R0 becomes bit 0 of R1, bit 7 of R1 becomes bit 0 of R0, and so on.	**04**
	(c)	Number FFh is placed somewhere in external RAM between locations 0100h and 0200h. Find the address of that location and put that address in R6 (LSB) and R7 (MSB).	**07**
Q.4	**(a)**	Enlist features of ADC module of ATMEGA 32 µC.	**03**
	(b)	8 devices are connected one with each pin of Port 1. Write a program to turn off devices connected to pin 1.0 to pin 1.3 and turn on devices connected to pin 1.2 and p1.7.	**04**
	(c)	Set every third byte in internal RAM from address 20h to 7Fh to FFH	**07**
Q.5	**(a)**	Explain ADCSRA Register of ATMEGA 32 µC.	**03**
	(b)	Draw and Explain ATmega 32 pin configuration.	**04**
	(c)	Write a C Program to display "BME" in 1st line and your name in 2nd line of LCD for ATMEGA 32 µC.	**07**
Q.6	**(a)**	Draw and explain 8-bit timer module.	**03**
	(b)	Explain STATUS Register of ATMEGA 32 µC.	**04**
	(c)	Write a C Program to interface Stepper Motor with ATMEGA 32 µC.	**07**
Q.7	**(a)**	Explain UCSRA register of ATMEGA 32 µC.	**03**
	(b)	What is Interrupt? Explain working of it in ATMEGA 32 µC.	**04**
	(c)	Write a C program to generate square wave of 1 KHz using timer1. (Crystal freq:8MHz)	**07**

Q.8	**(a)**	Enlist various interrupt sources of ATMEGA 32 µC.	**03**
	(b)	Write a C Program to Send and receive serial communication with computer at 19200 Baud.	**04**
	(c)	Explain Architecture of ATMEGA 32 µC.	**07**

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