Seat No.: _____ Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV EXAMINATION – SUMMER 2020

Subject Code: 3141008 **Date:02/11/2020**

Subject Name: Microprocessor & Microcontroller

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.**

Q.1	**(a)**	List the applications in which microcontrollers are used.	**03**
	(b)	Explain the functions of following pins of 8085. 1.ALE 2.TRAP 3.RESET OUT 4.READY	**04**
	(c)	Discuss the flag register of 8085.	**07**
Q.2	**(a)**	Differentiate between Microprocessor and Microcontroller.	**03**
	(b)	What is the use of stack and stack pointer in ATMega32? How many locations of stack are used when CALL and RCALL instructions are executed?	**04**
	(c)	List the features of RISC Architecture.	**07**
		OR	
	(c)	Explain ATMega32 Data memory in detail.	**07**
Q.3	**(a)**	Write a program to get status of PB3 pin and put it on PB0 pin.	**03**
	(b)	Write a program to generate square wave with 80% duty cycle on bit PC7.	**04**
	(c)	Explain following instructions: 1.SWAP 2.ASR 3.NEG 4.EOR 5.TST 6.SBR 7.BRCC	**07**
		OR	
Q.3	**(a)**	Write a program to find no of 1s in given byte.	**03**
	(b)	How many fuse bits are available in ATMega32? How are they used?	**04**
	(c)	Explain addressing modes of ATMega32 with the example.	**07**
Q.4	**(a)**	List some of the interrupt sources in ATMega32.	**03**
	(b)	What is the difference between RET and RETI instructions? Explain why we cannot use RET instead of RETI as the last instruction of interrupt service routine (ISR).	**04**
	(c)	Assuming clock pulses are fed into pin T1 (PB1) of ATmega32.Write a program for counter 1 in normal mode to count the pulses on falling edge and display the status of TCNT1 count on PORT C and PORT D.	**07**
		OR	
Q.4	**(a)**	Write down the steps to program Timer 0 in Normal Mode.	**03**
	(b)	Write a program for ATMega32 to transfer letter 'Z' serially at 9600 baud rate continuously. Assume XTAL=8 MHz.	**04**
	(c)	Write a program in C to generate a square wave of 16 KHz on pin PORTB.3.USE XTAL= 8 MHz. Use timer 0 in CTC Mode.	**07**
Q.5	**(a)**	What is the use of input capturing? Which timers of ATMega32 can be used for input capturing?	**03**
	(b)	Write the steps for reading data from SPI Device in single byte mode.	**04**
	(c)	Explain the connection of stepper motor with ATMega32.Write a program to rotate it continuously.	**07**
		OR	
Q.5	**(a)**	What is clock stretching with reference to I2C protocol?	**03**
	(b)	Draw the necessary circuit for 8 bit data transfer between ATMega32 and LCD.Use PORT A of ATMega32 for 8 bit data.	**04**
	(c)	State the features of ADC of ATMega32 and discuss steps of ADC programming.	**07**