Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV (NEW) EXAMINATION – WINTER 2021

Subject Code:3141008 Date:24/12/2021

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.**
4. **Simple and non-programmable scientific calculators are allowed.**

Q.1	**(a)**	What is the size of data bus and address bus in 8085? Explain in brief function of ALE signal.	**03**
	(b)	Differentiate between microprocessor and microcontroller.	**04**
	(c)	Explain functions various registers available in 8085 in brief.	**07**
Q.2	**(a)**	Explain the functions of following pins of 8085. 1. Ready 2.Trap 3.SOD	**03**
	(b)	What does the term embedded system mean? Why embedded system is also called dedicated system?	**04**
	(c)	Compare Harvard Architecture and Von Neumann Architecture.	**07**
		OR	
	(c)	Explain various addressing modes of AVR microcontroller with example.	**07**
Q.3	**(a)**	Explain Bitwise AND and Bitwise OR operators with example.	**03**
	(b)	Explain the functions of following pins: 1. INT2 2. TXD 3. AVCC 4. ICP.	**04**
	(c)	Explain following instructions for ATmega32. 1. SUB 2. EOR 3.FMULL 4.CLR 5.DES 6.INC 7. CLN	**07**
		OR	
Q.3	**(a)**	Explain the function of any three flags of status register.	**03**
	(b)	Write a program to find number of 1s in 0xFE.	**04**
	(c)	Explain conditional branch instructions BREQ and BRNE with examples. Write an AVR ALP to toggle PA0 pin 100 times using conditional branch instruction.	**07**
Q.4	**(a)**	Draw and explain TCCR0 register for ATMega32.	**03**
	(b)	List various sources of AVR interrupts and their priorities.	**04**
	(c)	Write a program to load 0x34 in PORTC register and complement PORTC 700 times.	**07**
		OR	
Q.4	**(a)**	Explain any three assembler directives in brief.	**03**
	(b)	Write down any four data types used by AVR C Compliers with their size and data range.	**04**
	(c)	What is the role of stack and stack pointer while executing CALL and RET instruction? Explain it with the help of example.	**07**
Q.5	**(a)**	Draw a circuit diagram for controlling a lamp (working on 12V) using Opto isolator and ATMega32.	**03**
	(b)	List down the characteristics of ADC peripheral of ATMega32.	**04**
	(c)	Explain Programming steps to transfer and receive data serially from ATmega32.	**07**
		OR	
Q.5	**(a)**	How to enable and disable interrupt in ATmega32?	**03**
	(b)	Write down steps to generate time delay using timer 0 in normal mode in ATmega32.	**04**
	(c)	Explain stepper motor interfacing with ATmega32 with appropriate diagram	**07**