Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER– IV(NEW) EXAMINATION – SUMMER 2023

Subject Code:3141008 Date:17-07-2023

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)**	Write the conditions when Parity flag, Zero flag and Sign flag will be set and reset in 8085.	**03**
	(b)	What is the size of stack pointer and program counter in 8085? Explain their functions also.	**04**
	(c)	Explain the function of following pins of 8085. 1. TRAP 2. SOD 3. HLDA 4. READY	**07**
Q.2	**(a)**	Explain (1) LDS (2) STS instruction with the help of an example.	**03**
	(b)	Draw and explain Data memory space of AVR with no extended I/O memory.	**04**
	(c)	List down criteria for choosing a microcontroller to use it in any electronics circuits and system.	**07**
		OR	
	(c)	Assume that R20 has packed BCD.Write a program to convert the packed BCD to two ASCII numbers and place them in R21 and R22.	**07**
Q.3	**(a)**	Write down the conditions when Negative flag and Overflow flag will be set and reset in AVR.	**03**
	(b)	Explain the function of DDRx,PORTx and PINx registers in AVR.	**04**
	(c)	Write a program to find number of 1s in a given byte.	**07**
		OR	
Q.3	**(a)**	What is branch penalty and its role in AVR?	**03**
	(b)	Specify the reasons for writing program in C language instead of assembly language.	**04**
	(c)	List down logical instructions used in AVR and explain any 4 of them with an example.	**07**
Q.4	**(a)**	List down sources of interrupts in the AVR.	**03**
	(b)	Explain function of each bit of TCCR0 (Timer/Counter Control Register).	**04**
	(c)	Explain following instructions with an example. 1.SWAP 2.ASR 3.ROL 4.LSR	**07**
		OR	
Q.4	**(a)**	Discuss the function of X, Y and Z register in AVR?	**03**
	(b)	Write a AVR C program to toggle only bit 4 of PORT C continuously without disturbing the rest of pins of PORT B.	**04**
	(c)	Write down steps to program Timer 2 in normal mode.	**07**
Q.5	**(a)**	Find the value for TCCR1A and TCCR1B to program Timer 1 as Normal mode and the OC1A generator as square wave generator and no prescaler.	**03**
	(b)	List down the registers associated with USART and explain the role of each register in brief.	**04**
	(c)	Write down steps to program A/D Converter using polling.	**07**
		OR	
Q.5	**(a)**	Explain with neat diagram, stepper motor interfacing with AVR	**03**
	(b)	Give the name and functions of register used for SPI Protocol.	**04**
	(c)	List down features of I2C protocol and explain any two in details.	**07**

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