Enrolment No./Seat No_____

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER–IV EXAMINATION – SUMMER 2025

Subject Code:3141008 Date:27-05-2025

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.**

			Marks
Q.1	**(a)**	List out the features of AVR microcontroller.	**03**
	(b)	Compare Microprocessor and Microcontroller.	**04**
	(c)	Draw and explain architecture of 8 bit 8085 microprocessor.	**07**
Q.2	**(a)**	Find the time delay generated by following delay subroutine if the system has an AVR with crystal frequency 1MHz. DELAY: LDI R20,200 LOOP2: LDI R21,100 LOOP1: NOP DEC R21 BRNE LOOP1 DEC R20 BRNE LOOP2 RET	**03**
	(b)	Draw and explain status register of AVR Microcontroller.	**04**
	(c)	Explain following instructions with proper example: 1. LDI 2. BREQ 3. CP 4. STS 5. PUSH 6. ADIW 7. OUT	**07**
		OR	
	(c)	Assume that the data memory location 0x315 contains FD (hex). Write an assembly language program to convert it into decimal and save the result into the location 0x322,0x323 and 0x324 Where least significant digit store into 0x322.	**07**
Q.3	**(a)**	Write an AVR C Program to send values 00 to FF on Port B.	**03**
	(b)	Write an AVR assembly language program to find number of 0s in 0x99.	**04**
	(c)	Explain various addressing modes of AVR microcontroller with appropriate example.	**07**
		OR	
Q.3	**(a)**	Differentiate Harvard architecture and von Neumann architecture.	**03**
	(b)	Read and test PORT B to see whether it has the value 45H. If it does, send 99H to PORTC otherwise cleared the PORTC.	**04**

	(c)	Interface 8k memory with starting address 8000h with 8085 microprocessors.	**07**
Q.4	**(a)**	What is need of RTC?	**03**
	(b)	A Switch is connected to pin PB0 and LED to pin PB7.Write a program to get the status of switch and send it to the LED.	**04**
	(c)	Write down the steps to program Timer0 in normal mode	**07**
		OR	
Q.4	**(a)**	Draw and explain fast PWM mode.	**03**
	(b)	Find the contents of register R20 after each of the following Instructions: (a) LDI R20,0X56 SWAP R20 (b) LDI R20,0X6A LDI R21,0X6A EOR R20, R21	**04**
	(c)	List out Programming steps to transfer and receive data serially from AVR using UART protocol.	**07**
Q.5	**(a)**	Draw interfacing of LCD with AVR for 8bit data.	**03**
	(b)	Write an AVR assembly language program to perform 15/2, store remainder in R20 register and quotient in R21 register	**04**
	(c)	Write down different steps in executing an Interrupt.	**07**
		OR	
Q.5	**(a)**	Discuss the SPSR register associated with SPI Protocol.	**03**
	(b)	Compare: 1. JMP and RJMP instructions. 2. RET and RETI instructions.	**04**
	(c)	List out the steps for programing A/D converter of AVR using polling method.	**07**

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