GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–IV (NEW) EXAMINATION – SUMMER 2021

Subject Code:3141008   Date:07/09/2021

Subject Name:Microprocessor & Microcontroller

Time:02:30 PM TO 05:00 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)	Explain the function of data bus and control bus in 8085.	03
	(b)	What is the size of stack pointer and program counter and accumulator in 8085? Explain the functions of each.	04
	(c)	Which flags are available in 8085? Write down function of each flag.	07
Q.2	(a)	Explain the functions of following pins of 8085. 1.INTR 2.CLK 3. ALE	03
	(b)	How many general-purpose registers are available in ATMega32? Write down instructions used to copy data from memory to general purpose register and vice versa.	04
	(c)	What criteria do designers consider in choosing microcontroller? Explain in the brief reason for each criterion.	07
		OR	
	(c)	Compare RISC architecture with CISC architecture.	07
Q.3	(a)	A Given AVR has $3FFF as the address of the last location of its on-chip ROM.What is the size of on-chip ROM for this AVR?	03
	(b)	A switch is connected to pin PB2 and LED to pin PB6.Write an assembly language program to get status of switch and send it to LED.	04
	(c)	Explain following instructions for ATmega32. 1.DEC 2. CP 3.CLI 4.ORI 5.SER 6.COM 7. LD	07
		OR	
Q.3	(a)	Write a program to find no of 0s in given byte.	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 an ISR.	04
	(c)	What do mean by addressing modes? Explain addressing modes used to access fixed data and look -up tables stored in program ROM with the help of an example.	07
Q.4	(a)	List and explain clock sources in ATMega32.	03
	(b)	Write down the steps to program Timer 0 in CTC Mode.	04
	(c)	Write an assembly language program for following: Assuming that a 1Hz clock pulse is fed into pin T0, use the TOV0 flag to extend Timer0 to a 16-bit counter and display on PORTC and PORTD.	07
		OR	
Q.4	(a)	Explain unconditional branch instructions JMP and RJMP with examples. What is the difference between JMP and RJMP?	03
	(b)	List down the steps in executing an interrupt in ATMega32.	04
	(c)	Write a program in C to generate a square wave of 3 KHz on pin PORTB.5. Use XTAL= 16 MHz, Use timer 0.	07

Q.5 **(a)** Discuss the clock stretching and Arbitration feature supported by I2C protocol.   **03**

(b) List down registers associated for serial port programming in ATMega32 and explain functions of each.   **04**

(c) A switch is connected to pin PA4. Write a C Program to monitor the status of Switch S1 and perform the following.   **07**
  a. If S1=0, the stepper motor moves clockwise
  b. If S1=1, the stepper motor moves anticlockwise

OR

Q.5 **(a)** What is need of RTC?. Explain interfacing of RTC with AVR microcontroller.   **03**

(b) Write the steps for writing data from SPI Device in multi byte burst mode.   **04**

(c) State the features of ADC of ATMega32 and discuss steps of ADC programming.   **07**

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