

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2017

Subject Code: 2173203

Date: 02/11/2017

Subject Name: Microprocessor and 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.

		MARKS
Q.1	(a) List out the general-purpose register available in 8085.	03
	(b) Explain the flag register and flag bits of 8085.	04
	(c) Discuss the difference between microprocessor and microcontroller. Explain the functionality of port 0 in 8051 in short.	07
Q.2	(a) What is interrupt in 8085 Microprocessor? List out the hardware and software interrupts used in 8085 Microprocessor.	03
	(b) Explain the functions of following instructions of 8085 – state its number of bytes occupied, number of Machine cycle required and T-states.	04
	1. MOV A,M	
	2. LXI H,2500H	
	3. DAA	
	4. STA 9100H	
	(c) What are the addressing modes for 8051? Explain in brief giving suitable example.	07
	OR	
	(c) Draw the internal block diagram of microprocessor 8085 and explain the working of Program Counter register.	07
Q.3	(a) Show how the AVR would represent -128.	03
	(b) Explain AVR family in detail.	04
	(c) With diagram explain internal architecture of AVR ATmega32 microcontroller.	07
	OR	
Q.3	(a) Show how flag registers is affected by following instructions LDI R21, 0xF5 LDI R22, 0x0B ADD R21,R22	03
	(b) Write an AVR program in which assume that bit PB3 is an input and represents the condition of a door alarm. If it goes LOW, it means that the door is open. Monitor the bit continuously. Whenever it goes LOW, send a High-to-Low pulse to port PC5 to turn on a buzzer.	04
	(c) Explain CALL, IJMP and RET Instruction with example for the AVR Controller.	07
Q.4	(a) What is the role of DDR register in inputting data for AVR Controller?	03
	(b) Write a program to see if the internal RAM location \$137 contains an even value. If so, write 0x55 into location \$200. If not, write 0x63 into location \$200.	04
	(c) Using a prescaler of 64, write a program to generate a delay of 1920 μs. Assume XTAL = 8 MHz.	07
	OR	
Q.4	(a) What is the difference between interrupts and polling?	03
	(b) Write an AVR C program to get a byte of data from Port C. If it is less	04

than 100, send it to Port B; otherwise, send it to Port D.

- (c) Write an AVR C program to send out the value 44H serially one bit at a time via PORTC, pin 3. The LSB should go out first. **07**

- Q.5** (a) Compare serial versus parallel data transfer. **03**
(b) Write a C Program for the AVR to receive bytes of data serially and put them on Port A. Set the baud rate at 9600, 8-bit data, and 1 stop bit. **04**
(c) Write a C program to read the keypad and send the results to Port D. Assuming PC0-PC3 connected to columns and PC4-PC7 connected to rows. **07**

OR

- Q.5** (a) Draw LCD Write timing diagram for 4-bit mode. **03**
(b) For a 10-bit ADC, the reference voltage $V_{ref} = 2.56 \text{ V}$. Calculate the D0-D9 output if the analog input is (a) 0.2 V and (b) 0 V. How much is the variation between (a) and (b)? **04**
(c) Explain the function of I2C (TWI) and DS1307 registers in AVR. **07**

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