

2023

**EMBEDDED SYSTEMS**

Full Marks: 100

Time: Three hours

*The figures in the margin indicate full marks for the questions.*

*Answer any five questions.*

Central Institute Of Technology  
Kokrajhar :: Bodoland

1.	a)	Describe the function of following in 8051 microcontroller (i) Program counter (ii) Flag register (iii) Stack pointer (iv) DPTR register (v) PSW register (vi) Stack pointer (vii) Crystal Oscillator (viii) Timers	16
	b)	Write a program to store the contents of port P1 into register R2 of register bank 1 of 8051 microcontroller.	4
2.	a)	Write an 8051 assembly program to turn on an LED connected to port P1.1, only when an external pulse is given to port P1.2.	5
	b)	Write an 8051 assembly language program to add the contents of port P1 of 8051 microcontroller with the contents of the accumulator and display the results in port P2.	5
	c)	Define the following instructions: JC, JNB, LCALL, DJNZ, CLR, ANL, DIV, CPL, ORG and RET.	10

3.	a)	How the following conversion is done? (i) Hexadecimal to ASCII. (ii) Hexadecimal to decimal.	6
	b)	Write an 8051 C program to receive data from port P1, wait for some time and then send it to port P2.	6
	c)	Discuss the following: i. Input output ports in 8051 microcontroller. ii. Memory mapping of RAM and ROM in 8051 microcontroller.	8
4.	a)	Discuss the functions of registers used in 8051 timer programming.	6
	b)	Write a program to generate a 1kHz waveform from port P1.1 of 8051 microcontroller using timers. Consider the crystal frequency as 11.05MHz.	8
	c)	Write a program to operate 8051 microcontroller as a counter using any timer.	6
5.	a)	Discuss the functions of registers used in 8051 serial port communication.	6
	b)	Write a program to transmit or receive data serially using 8051 microcontroller.	8
	c)	Discuss the C data types used in 8051 programming.	6
6.	a)	How the register select and read/write pins of LCD are operated during interfacing with 8051 microcontroller?	4
	b)	Write a program to send a letter "A" from 8051 microcontroller to LCD. Also draw the interfacing diagram.	10
	c)	Write an 8051 C program to perform hexadecimal to decimal conversion.	6
7.		Write short notes on any two of the following	10*2=20
	a)	Addressing modes in 8051 microcontroller.	
	b)	ADC interfacing with 8051 microcontroller.	
	c)	Selected operations of STM 32 microcontroller.	