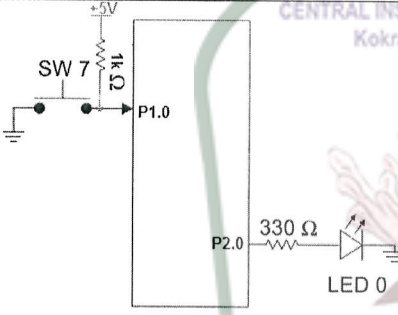**2024**

Microcontroller & Applications

Full Marks : 100

Time : Three hours

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

*Answer **any five** from the following.*

1.	a)	Write instructions to monitor the status of port 2 continuously until it is 55H		4
	b)	Write instructions to toggle the status of pin P2.0 every time the switch is pressed.		4
	c)	Explain the operation of Timer in Mode 1 with diagram		8
	d)	Give a comparison between serial and parallel data communication		4
2.	a)	Write a comparison in between RISC and CISC processors		10
	b)	Write an assembly program to add 5 ten times.		4
	c)	Store the content of Accumulator and B registers on to the stack and then retrieve them to internal RAM address 21h, 22h.		6
3.	a)	Write a program to add first 5 natural numbers and send the result to P1		5
	b)	i)	Mention the various addressing modes available in Intel 8051 with 2 examples of each.	10
		ii)	Describe the mode 1 operation of the timer	5
4.	a)	Write a program to transmit the content of the Accumulator into bit port 1.4 serially with LSB going first.		4
	b)	Write a assembly code to send 55H to ports P1 and P2, with finite delay in between the two write operations.		6

	c)	Give a detailed comparison between different types of Programming Languages used for microcontrollers	10
5.	a)	Write a program to to generate a square wave of frequency 1kHz on bit port P1.2. Use mode 2, Timer 0.	10
	b)	Draw the address range of internal RAM showing several sections.	5
	c)	Write an assembly program to generate a square wave at the bit port 1.3	5
6	a)	Write a program to add three numbers stored at internal RAM address 10H, 11H and 12H and store the lower byte of result into internal RAM address 20H and upper bits into 21H.	10
	b)	Write a program in Assembly. Assume that 8 switches are connected to port 1 pin and 8 LEDs are connected to port2 pins, write instructions to read status of all switches and send it to LEDs continuously	5
	c)	Explain the operation of Mode 2 of timer with proper diagram.	5