Total number of printed pages:1 **B.Tech./7th /UIE713**

2024

EMBEDDED SYSTEMS

Full Marks : 100

Time : Three hours

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

*Answer **any five** questions.*

1.	a)	Explain the functions of following components in 8051 Microcontroller: i. Timers ii.Special Function Registers iii. Crystal Oscillators iv. RAM	8
	b)	How the register banks of 8051 Microcontroller are selected? Write an assembly language program to store a data of 30H in register R0 of register bank RB2.	6
	c)	Write a program in 8051 Microcontroller to accept 8 bits of data from port P0 and port P1, and perform OR operation and display the resultant data in port P2.	6
2.	a)	Write an embedded C program to blink port P0.0 and P0.7 of 8051 Microcontroller alternatively with some delay.	6
	b)	Define the function of following instructions: JB, DJNZ, ACALL, SETB, SJMP, DB	6
	c)	Design an 8051 based system with circuit diagram and code to check port P1.1 which is connected to a proximity sensor placed in a door to check the entry of persons in a room. The door will get open using a DC motor connected to port P2.1 and port P2.2 when the proximity sensor detects a person. The door will automatically get closed after some delay.	8
3.	a)	Describe the operation of different registers used in 8051 Timers.	6
	b)	Write a program to generate a square waveform of 100Hz using the timer T_0 of 8051 microcontroller. Consider the crystal frequency as 12 MHz.	7
	c)	How 8051 timers can be used as a counter? Write a program to use 8051 timers as a counter.	7
4.	a)	What are the requirements for performing serial communication between	7

8051 Microcontroller and PC? How the communication is accomplished?

b) Describe the operation of different registers used in 8051 serial communication. 6

c) Write a program to send or receive data between 8051 Microcontroller and PC. 7

5. a) Draw the circuit diagram for LCD interfacing with 8051 Microcontroller. Write a suitable program to display a word in LCD. 10

b) Discuss the different features of LPC2148 Microcontroller (ARM7). 10

6. Write short notes on any two of the following 10*2=20

a) ADC interfacing with 8051 Microcontroller.

b) GPIO programming in LPC2148 Microcontroller.

c) 8051 Addressing Modes