Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

End - Term Examinations –MAY 2025

Date: 30-05-2025 **Time:** 01.00 pm – 04:00 pm

School: SOE	**Program:** B. Tech - EEE	
Course Code: EEE2005	**Course Name:** Microprocessors and Microcontrollers	
Semester: IV	**Max Marks**: 100	**Weightage**: 50%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**24**	**26**	**24**	**26**	**--**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **10Q x 2M=20M**

1.	List the functions of the Program Counter (PC) in 8051 microcontrollers	**2 Marks**	**L1**	**CO1**
2.	Recall the following terms used for the Microprocessors a) BYTE b) NIBBLE	**2 Marks**	**L1**	**CO1**
3.	State the purpose of the following instructions in 8051microcontroller a) CJNE A, Direct address, Relative address b) ANL A, @Rn	**2 Marks**	**L1**	**CO2**
4.	List out the various types of addressing modes of 8051microcontroller	**2 Marks**	**L1**	**CO2**
5.	Identify the addressing mode used for the following instructions a) MOV @R0, A b) MOVX A, @A+DPTR	**2 Marks**	**L1**	**CO2**
6.	Recall the instructions used to start and stop the timer operations	**2 Marks**	**L1**	**CO3**
7.	How 16 bits timer registers are accessed by 8 bit 8051 microcontroller**.**	**2 Marks**	**L1**	**CO3**

8.	List the two methods of data transfer used in computers	**2 Marks**	**L1**	**CO4**
9.	List the differences between interrupts and polling	**2 Marks**	**L1**	**CO4**
10.	Recall the role of RTS and CTS pins of RS232 DB-9	**2 Marks**	**L1**	**CO4**

Part B

Answer the Questions. **Total Marks 80M**

11.	**a.**	With neat sketch, explain the internal RAM structure of 8051 microcontroller.	10 Marks	L2	CO1
	b.	The Program Status Word (PSW) in the 8051-microcontroller architecture is a special-purpose register that indicates the current state of the CPU and includes various flags that reflect the results of arithmetic and logical operations. With a neat sketch explains the Program Status Word (PSW) register in 8051 Microcontroller**.**	10 Marks	L2	CO1
		Or			
12.	a.	Microcontrollers are mainly used in small-scale applications like washing machines, cameras, security alarms, and keyboard controllers. Conversely, microprocessors are employed in personal computers, complex industrial controllers, traffic lights, defense systems, and other larger-scale systems. Explain the difference between Microprocessors and Microcontrollers	10 Marks	L2	CO1

	b.	Show the status of stack and stack pointer after the following instructions. Assume the default stack area.
		
		MOV R6, #25H
		MOV R1, #12H
		MOV R4, #0F3H
		PUSH 6
		PUSH 1
		PUSH 4
			10 Marks	L2	CO1

13.	a.	Explain with sketches the rotational instructions used in 8051 Microcontroller.	10 Marks	L2	CO2
	b.	Illustrate with example, the program that finds the number of '1's in each byte	10 Marks	L3	CO2
		Or			
14.	a.	Assume that register A has packed BCD, illustrate a program to convert packed BCD to two ASCII numbers and place them in R2 and R6	10 Marks	L3	CO2

	b.	Interpret the status of A, B, R0, R1, R2, R3 and address location 30H after the execution of the below program.
		MOV R0, #43H
		MOV R1, #21H
		MOV R2, #87H
		MOV R3, #56H
		MOV A, R0
		MOV B, R2
		MUL AB
		MOV 30H, A
		END
			10 Marks	L2	CO2

15.	**a.**	Explain the 8051 TMOD Register with necessary diagram and mention the purpose of TMOD register	10 Marks	L2	CO3
	b.	Assume XTAL = 11.0592 MHz, write a program to generate a square wave of 50 kHz frequency on pin P2.3 select timer 1- and 16-bit timer mode.	10 Marks	L3	CO3
		Or			
16.	**a.**	Summarize the characteristics and operations of mode1 programming of Timer in 8051 microcontrollers.	10 Marks	L2	CO3
	b.	Assume that XTAL = 22 MHz, write a program to generate a square wave of 2 kHz frequency on pin P1.5.	10 Marks	L3	CO3

17.	**a.**	Explain the functions and significance of the SBUF and SCON registers in facilitating serial communication in the 8051 microcontrollers. Explain how these registers are utilized in both transmitting and receiving data serially.	10 Marks	L2	CO 4
	b.	Illustrate an assembly language program for the 8051 to transfer "ABC" serially at 4800 baud, 8-bit data, 1 stop bit and display continuously	10 Marks	L3	CO 4
		Or			
18.	**a.**	Explain the Interrupt Enable Register with the necessary diagram. Also, explain the process of enabling and disabling an interrupt	10 Marks	L2	CO 4
	b.	Illustrate a program for the 8051 to transfer "YES" serially at 9600 baud, 8-bit data, 1 stop bit, do this continuously	10 Marks	L3	CO 4