Reg. No.																

Question Paper Code	14172

M.E. / M.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2025

First Semester

M.E. - Embedded Systems Technologies

24PESPC102 - MICROCONTROLLER BASED SYSTEM DESIGN

Regulations - 2024

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	The number of I/O ports in 8051 is (a) 2 (b) 3 (c) 4 (d) 5	1	K1	CO1
2.	The main use of timers in 8051 is (a) Data Transfer (b) Counting events (c) Program storing (d) Debugging	1	K1	CO1
3.	RTOS stands for (a) Real-Time Operator System (b) Real-Time Operating System (c) Rapid Time OS (d) Running Time OS	1	K1	CO2
4.	Which mode is used in 8051 for serial communication? (a) Mode 1 (b) Mode 2 (c) Mode 3 (d) All	1	K1	CO2
5.	PT0 represents the priority level of _____ interrupt. (a) Serial port (b) Timer0 (c) Timer1 (d) Parallel port	1	K1	CO3
6.	MPLAB is used for (a) Multimedia editing (b) Programming PIC (c) Debugging 8051 (d) None	1	K1	CO3
7.	Identify the execution speed of instructions in PIC especially while operating at the maximum value of clock rate. (a) 0.1 μs (b) 0.2 μs (c) 0.4 μs (d) 0.8 μs	1	K2	CO4
8.	PIC microcontrollers use which type of architecture? (a) Von Neumann (b) Harvard (c) Princeton (d) Modified Harvard	1	K2	CO4
9.	UART is used for (a) Parallel communication (b) Serial communication (c) Memory access (d) None	1	K1	CO5
10.	Data acquisition systems are (a) Stand-alone (b) PC-based (c) Both (d) None	1	K1	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	List the various addressing modes of 8051.	2	K1	CO1
12.	Differentiate Special Function Registers and General Purpose Registers in 8051 memories.	2	K2	CO1
13.	Define serial communication.	2	K1	CO2
14.	What is meant by single bit instructions?	2	K1	CO2
15.	Develop an ALP to receive input from port P1.5 and if it is high then an output 35H is sent to port 0.	2	K3	CO3
16.	Explain the functions of the TMOD register.	2	K2	CO3
17.	Mention the addressing modes of PIC microcontroller.	2	K2	CO4
18.	Write the various interrupts of PIC microcontroller.	2	K1	CO4
19.	Difference between Flash and EEPROM memories.	2	K1	CO5
20.	What is LCD interfacing?	2	K1	CO5
21.	Calculate the step size for a PIC18 based system, if Vref =Vdd =5V.	2	K3	CO6

22.		Illustrate how to make a port as I/P and O/P port in PIC micro controller.	2	K2	CO6

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the architecture of 8051 with neat block diagram.	11	K2	CO1
		OR			
	b)	Discuss the functioning of timers and counters in detail.	11	K2	CO1
24.	a)	Develop an ALP to sort the given numbers in ascending order using 8051.	11	K3	CO2
		OR			
	b)	Divide the content of r_0 by r_1. Store the result in r_2 (answer) and r_3 (reminder). Then restore the original content of r_0.	11	K3	CO2
25.	a)	Develop a program to generate a square wave using 8051 timer/Counter of 100 ms and 50% duty cycle.	11	K3	CO3
		OR			
	b)	Build the interfacing of 16 x 2 LCD display using 8051 microcontroller.	11	K3	CO3
26.	a)	Evaluate the RAM/ROM allocation of PIC with necessary diagrams.	11	K2	CO4
		OR			
	b)	Explain the architecture of PIC microcontroller with neat block diagram.	11	K2	CO4
27.	a)	Explain about I2C bus in PIC microcontroller and describe its operations.	11	K2	CO5
		OR			
	b)	Describe how ADC and DAC interfacing is done with necessary diagrams.	11	K2	CO5
28.	a)	Elaborate the concept of generation of gate signals for converters/inverters.	11	K2	CO6
		OR			
	b)	Explain about PIC microcontroller based Data Acquisition Syste.	11	K2	CO6