Reg. No.												

Question Paper Code	12913

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024

Third Semester

Computer Science and Engineering (IoT)

20CIPC301 - COMPUTER ARCHITECTURE AND MICROCONTROLLERS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (10 × 2 = 20 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Draw functional units of a computer.	2	K1	CO1
2.	State Amdahl's law.	2	K1	CO1
3.	Write the overflow conditions for addition and subtraction.	2	K1	CO2
4.	Define – Guard bit and Rounding.	2	K1	CO2
5.	What are the first two steps for executing an every instruction?	2	K1	CO3
6.	Show the portion of data path used for fetching an instruction and incrementing program counter.	2	K2	CO3
7.	What is data pointer (DTPR)?	2	K1	CO4
8.	Mention any two applications of 8051 microcontrollers.	2	K2	CO4
9.	Outline the function of timer registers used in 8051.	2	K2	CO5
10.	Which register is used for serial programming in 8051 microcontroller?	2	K1	CO5

PART - B (5 × 13 = 65 Marks)

Answer ALL Questions

			Marks	K – Level	CO
11.	a)	Explain how performance is calculated in computer system and derive necessary equations.	13	K2	CO1
		OR			
	b)	Consider three different processors, P1 P2 and P3, executing the same instruction set. P1 has a 3 GHz clock rate and a CPI of 1.5. P2 has a 2.5 GHz clock rate and a CPI of 1.0. P3 has a 4.0 GHz clock rate and a CPI of 2.2. Which processor has the highest performance expressed in instructions per second? If the processors each execute a program in 10 seconds, find the number of cycles and the number of instructions.	13	K2	CO1
12.	a)	Explain the fixed point Multiplication algorithm in detail with a neat diagram and an example.	13	K2	CO2
		OR			
	b)	Explain in detail about floating point addition with a neat block diagram and flow chart.	13	K2	CO2

13.	a)	Explain the operation and control signals used in data path of R-type instructions in detail.	*13*	*K2*	*CO3*
		OR			
	b)	Explain data hazards and stalls with a neat diagrams and suitable examples.	*13*	*K2*	*CO3*
14.	a)	Draw the architecture of an 8051 microcontroller and explain each block.	*13*	*K2*	*CO4*
		OR			
	b)	Explain the different addressing modes of 8051 with an example.	*13*	*K2*	*CO4*
15.	a)	Explain TCON and TMOD SFR for 8051 Microcontroller.	*13*	*K2*	*CO5*
		OR			
	b)	Describe the different mode for serial communication in 8051 Microcontroller.	*13*	*K2*	*CO5*

PART - C (1 × 15 = 15 Marks)

16.	a)	Demonstrate how to interface the keyboard with the 8051 controller.	*15*	*K2*	*CO6*
		OR			
	b)	Explain the function of LCD interfacing with 8051.	*15*	*K2*	*CO6*