Reg. No.															

Question Paper Code	13533

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Fourth Semester

Electronics and Communication Engineering

(Common to Computer and Communication Engineering)

20ECPC402 – MICROCONTROLLERS AND EMBEDDED SYSTEMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	In the 8086 microprocessor, which flag is set to one if the most significant bit of the result is one and cleared to zero for a non-negative result? (a) Zero Flag (b) Trap Flag (c) Parity Flag (d) Sign Flag	1	K1	CO1
2.	Consider the instruction CMP BL,CL in 8086.Before execution the values of the registers are BL=01H, CL=01H. Determine the value of the registers after execution of the instruction. (a) AL=01H, CL=01H (b) AL=01H, BL=01H (c) BL=01H, CL=00H (d) BL=01H, CL=01H	1	K2	CO1
3.	Which among the following is a 16 bit register in 8051 microcontroller? (a) PC (b) A reg (c) B reg (d) Temporary Register	1	K2	CO2
4.	The addressing mode in which the data operand is a constant and it is a part of the instruction itself is known as _____. (a) Immediate addressing mode (b) Register addressing mode (c) Indirect addressing mode (d) Register Indirect addressing mode	1	K1	CO2
5.	If RD*=0,A1=1,A0=0,then the input read cycle performed for which port? (a) PORTB (b) PORTA (c) PORTC (d) PORTD	1	K2	CO3
6.	How many interrupt pins can be handled by 8259 IC in master slave configuration? (a) 1 (b) 8 (c) 64 (d) 32	1	K2	CO3
7.	As the forward voltage increases, the intensity of light_____. (a) Decreases (b) Increases (c) Both Decreases and Increases (d) None of the mentioned	1	K2	CO4
8.	Which of the following component can be used to indicate the three colors of light used in traffic light controller? (a) Microcontroller (b) LCD (c) 5v power supply (d) Seven segment display/LED	1	K1	CO4
9.	For good scheduler throughput should be…….. (a) Less (b) high (c) Medium (d) Both can be less and can be high	1	K1	CO5
10.	In a ARM controller ,the PC is generally implemented using the_____ (a) Caches (b) Heaps (c) General purpose register (d) Stack	1	K2	CO6

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	List the modes of operation in 8086.	2	K1	CO1
12.	Compare procedure and macros.	2	K2	CO1
13.	Mention the 8051 interrupts with its priority.	2	K1	CO2
14.	Write an 8051 program for finding two's complement of a number.	2	K2	CO2

15.	Why CAS2-CAS0 lines on 8259 PIC are bi-directional?		*2*	*K2*	*CO3*
16.	Write the features of 8255A.		*2*	*K1*	*CO3*
17.	Mention the difference between LED and LCD.		*2*	*K1*	*CO4*
18.	Mention two key features of a traffic light control embedded system.		*2*	*K1*	*CO4*
19.	Describe the steps in embedded system design process.		*2*	*K2*	*CO5*
20.	Define embedded system and List out major components of embedded system.		*2*	*K1*	*CO5*
21.	Name five peripherals in the LPC 2148 MCU.		*2*	*K1*	*CO6*
22.	Differentiate between ARM9 and Cortex M3 architectures.		*2*	*K2*	*CO6*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Draw and explain about the internal architecture of 8086.	*11*	*K2*	*CO1*
		OR			
	b)	Explain any 8 addressing modes of the 8086 processor with an example.	*11*	*K2*	*CO1*
24.	a)	Explain the instruction sets of 8051 with examples.	*11*	*K2*	*CO2*
		OR			
	b)	Write an ALP to perform arithmetic and logical operation using 8051.	*11*	*K2*	*CO2*
25.	a)	Describe the operation and functions of the 8251 USART with a neat and clearly labeled block diagram.	*11*	*K2*	*CO3*
		OR			
	b)	Explain the working and functions of the 8259 Programmable Interrupt Controller with a clear and well-labeled block diagram.	*11*	*K2*	*CO3*
26.	a)	Design and explain the alarm controller system.	*11*	*K3*	*CO4*
		OR			
	b)	Construct Microprocessor based system design for a traffic light controller with necessary code and flow diagram.	*11*	*K3*	*CO4*
27.	a)	Describe in detail about the design of model train controller.	*11*	*K2*	*CO5*
		OR			
	b)	Explain various design flow methodologies with a neat sketch.	*11*	*K2*	*CO5*
28.	a)	Draw the architecture of the ARM 9 processor and explain its functional units.	*11*	*K2*	*CO6*
		OR			
	b)	Draw the architecture of ARM Cortex M3 MCU processor and describe its functional units.	*11*	*K2*	*CO6*