Reg. No.															

Question Paper Code	13292

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV / DEC 2024

Fourth Semester

Electronics and Communication Engineering

20ECPC402 - MICROCONTROLLERS AND EMBEDDED SYSTEMS

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (20 × 1 = 20 Marks)

Answer ALL Questions

		Marks	*K – Level*	*CO*
1.	What is Microprocessor? (a) A multipurpose PLD that accepts binary data as input (b) A multipurpose PLD that accepts an integer as input (c) A multipurpose PLD that accepts whole numbers as input (d) A multipurpose PLD that accepts prime numbers as input	*1*	*K1*	*CO1*
2.	Which of the following addressing method does the instruction, MOV AX,[BX] represent? (a) register indirect addressing mode (b) direct addressing mode (c) register addressing mode (d) register relative addressing mode	*1*	*K1*	*CO1*
3.	Which of the following technology was used by Intel to design its first 8-bit microprocessor? (a) NMOS (b) HMOS (c) PMOS (d) TTL	*1*	*K1*	*CO1*
4.	What is the most appropriate criterion for choosing the right microcontroller of our choice? (a) speed (b) availability (c) ease with the product (d) all of the mentioned	*1*	*K1*	*CO2*
5.	How are the performance and the computer capability affected by increasing its internal bus width? (a) it increases and turns better (b) it decreases (c) remains the same (d) internal bus width doesn't affect the performance in any way	*1*	*K1*	*CO2*
6.	Unlike microprocessors, microcontrollers make use of batteries because they have: (a) high power dissipation (b) low power consumption (c) low voltage consumption (d) low current consumption	*1*	*K1*	*CO2*
7.	In 8255, bit addressability is a available with port (a) A (b) B (c) C (d) D	*1*	*K1*	*CO3*
8.	8 input DAC has (a) 8 Discrete voltage levels (b) 64 Discrete voltage levels (c)128 Discrete voltage levels (d) 256 Discrete voltage levels	*1*	*K1*	*CO3*
9.	In 8051 microcontroller, Timer operating in mode 0, the timer register size is (a) 8 bit (b)13bit (c)18bit (d) 64bit	*1*	*K1*	*CO3*

10. The number of LEDs that can be connected to a port of 8051, if all are expected to glow simultaneously is *1 K1 CO4*
    (a) 6
    (b) 8
    (c) 10
    (d) 12
11. The common register(s) for all the four channels of 8257 is *1 K1 CO4*
    (a) DMA address register
    (b) Terminal count register
    (c) Mode set register and status register
    (d) None of the mentioned
12. When a key is pressed, a debounce logic comes into operation in *1 K1 CO4*
    (a) scanned keyboard special error mode
    (b) scanned keyboard with N-key rollover
    (c) scanned keyboard mode with 2 key lockout
    (d) sensor matrix mode
13. What does ICE stand for? *1 K1 CO5*
    (a) in-circuit EPOM
    (b) in-code emulation
    (c) in-circuit emulation
    (d) in-code EPROM
14. Which of the following schedulers take decisions at run-time? *1 K1 CO5*
    (a) preemptive scheduler
    (b) non preemptive scheduler
    (c) dynamic scheduler
    (d) static scheduler
15. Which of the following is the design in which both the hardware and software are considered during the design? *1 K1 CO5*
    (a) platform-based design
    (b) memory-based design
    (c) software/hardware codesign
    (d) peripheral design
16. In real time operating system _____ *1 K1 CO5*
    (a) all processes have the same priority
    (b) a task must be serviced by its deadline period
    (c) process scheduling can be done only once
    (d) kernel is not required
17. How many registers does ARM have? *1 K1 CO6*
    (a) Four
    (b) Eight
    (c) Sixteen
    (d) Thirty-seven
18. How many instructions sets does ARM have? *1 K1 CO6*
    (a) One
    (b) Two
    (c) Three
    (d) Four
19. Which one of the following executes all instructions in one cycle? *1 K1 CO6*
    (a) ARM7
    (b) 8051
    (c) Both a and b
    (d) None of the above

20.	What rate can define the timing in the UART? (a) bit rate (b) baud rate (c) speed rate (d) voltage rate		*1*	*K1*	*CO6*

PART - B (10 × 2 = 20 Marks)

Answer ALL Questions

21.	What are the 8086 interrupt types?		*2*	*K1*	*CO1*
22.	Differentiate between a macro and a procedure.		*2*	*K2*	*CO1*
23.	List out some of the features of the 8051.		*2*	*K1*	*CO2*
24.	What is Special Function Register?		*2*	*K1*	*CO2*
25.	Give the various modes of Timer.		*2*	*K1*	*CO3*
26.	What is key debounce?		*2*	*K1*	*CO3*
27.	What are the requirements of embedded system?		*2*	*K1*	*CO4*
28.	Classify some task scheduling algorithms.		*2*	*K1*	*CO4*
29.	What is meant by UART?		*2*	*K1*	*CO5*
30.	List the features of ARM processors.		*2*	*K1*	*CO6*

PART - C (6 × 10 = 60 Marks)

Answer ALL Questions

31.	a)	i)	Explain various groups of instructions of 8086 with examples.	*4*	*K2*	*CO1*
		ii)	What is an addressing mode? Explain various addressing modes of 8086 with examples.	*6*	*K2*	*CO1*
			OR			
	b)	i)	Explain the different general-purpose registers of 8086.	*6*	*K2*	*CO1*
		ii)	Write 8086 ALP for the Block Transfer of Data.	*4*	*K2*	*CO1*
32.	a)		Explain with a neat diagram the architecture of 8051 Microcontroller.	*10*	*K2*	*CO2*
			OR			
	b)		Explain the following SFRs:(i) TMOD (ii) TCON (iii) SCON (iv) PCON.	*10*	*K2*	*CO2*
33.	a)		Describe in detail about the data transfer mechanism using DMA interfacing with 8051 Microcontroller.	*10*	*K2*	*CO3*
			OR			
	b)		Explain various operating modes of 8255.	*10*	*K2*	*CO3*
34.	a)		How the processor understand on which key is pressed and explain how 8279 works?	*10*	*K2*	*CO4*
			OR			
	b)		With neat diagrams explain the interfacing of an DAC with 8051.	*10*	*K2*	*CO4*
35.	a)		Discuss the various steps in embedded system design methodology with a suitable Example.	*10*	*K2*	*CO5*
			OR			
	b)		Describe about the various Scheduling policies in detail.	*10*	*K2*	*CO5*
36.	a)		Explain the ARM processor features & modes of operations.	*10*	*K2*	*CO6*
			OR			
	b)		Explain in detail about the architecture of CORTEX processor.	*10*	*K2*	*CO6*