KUMARAGURU
college of technology
character is life
1984

ENTER **B.E/B.TECH DEGREE EXAMINATIONS: MAY 2023**

(Regulation 2018)

Semester VI

ELECTRONICS AND COMMUNICATION ENGINEERING

U18ECI6202 & Microcontrollers

COURSE OUTCOMES

CO1:	Explain the architecture of 8051 microcontroller and develop C code for the given application
CO2:	Design and implement applications using 8051 microcontroller
CO3:	Describe the architecture of peripherals of ARM Cortex and write C code for the given application
CO4:	Build and verify real time applications using microprocessor/microcontroller

Time: Three Hours	Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

(Answer not more than 40 words)

1.	Mention any four special function registers in 8051 microcontroller.	CO1	[K_1]
2.	Distinguish between the microcontroller based and the microprocessor based systems.	CO1	[K_2]
3.	What are the major advantages of Atmel Microcontrollers?	CO1	[K_2]
4.	Examine the content of the bits PSW.0, PSW.7 and the accumulator of 8051 microcontroller after executing the program below. ORG 0H CLR C CLR A MOV R2, #1 L1: SUBB A, #1 DJNZ R2, L1 END	CO2	[K_4]
5.	Calculate the duty cycle of the square wave generated in the pin P2.3 of 8051 microcontroller when the following code is executed. ORG 0H L1: SETB P2.3 LCALL DELAY CLR P2.3 LCALL DELAY LCALL DELAY LCALL DELAY ORG 100H DELAY: NOP RET END	CO2	[K_3]
6.	Find TH1 value (in both decimal and hexadecimal) to set the serial communication baud rate	CO2	[K_3]

	to 9600 in 8051 microcontroller. Assume XTAL = 11.0592 MHz.			

7.	Estimate the delay generated while executing the following 8051 Assembly code if crystal frequency is 11.0592 MHz
	
	DELAY: MOV R3, #250 (1 Machine Cycle)
	HERE: NOP (1 Machine Cycle)
	      NOP (1 Machine Cycle)
	      NOP (1 Machine Cycle)
	      NOP (1 Machine Cycle)
	      DJNZ R3, HERE (2 Machine Cycles)
	      RET (2 Machine Cycles)
			CO2	[K4]

8.	List the advantages of RISC processors over CISC processors.		CO3	[K2]
9.	What is a Load-Store architecture?		CO3	[K1]
10.	Identify the major advantage of using Thumb instructions in ARM Processors.		CO3	[K3]

<div align="center">

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

</div>

11.	a)	Discuss the architecture of 8051 Microcontroller in detail with a neat block diagram	16	CO1	[K2]
12.	a)	Explain the interrupts in 8051 Microcontroller along with interrupt vector table and relevant special function registers.	16	CO1	[K2]
13.	a)	Generate a square wave with 50% duty cycle using Timer-0 Mode-1 in pin P1.0 of 8051 Microcontroller.	8	CO2	[K3]
	b)	Write an 8051 program to add the following data. Perform manual calculation and analyze the carry flag. Data: 92H, 23H, 66H, 87H, 0F5H	8	CO2	[K3]
14.	a)	Describe the addressing modes of 8051 microcontroller with examples.	8	CO2	[K3]
	b)	Propose an 8051 microcontroller based algorithm for implementing a traffic signal in a three-road junction.	8	CO4	[K6]
15.	a)	Elaborate the register organization in ARM Cortex processors.	16	CO3	[K2]
16.	a)	Explain 3-stage and 5-stage pipelining in ARM processors with a neat sketch.	16	CO3	[K2]

<div align="center">

****

</div>

Please indicate knowledge level (K₁toK₆) and Course Outcome level (CO1 to CO5) against each question for each subdivision.