Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Examination June 2022 (2019 scheme)

Course Code: ECT206

Course Name: COMPUTER ARCHITECTURE AND MICROCONTROLLERS

Max. Marks: 100 Duration: 3 Hours

PART A

(Answer all questions; each question carries 3 marks) Marks

1		Differentiate between Von-Neumann and Harvard Architecture.	(3)
2		Define Address bus, Data bus and Control bus.	(3)
3		Draw and explain PSW of 8051 microcontroller.	(3)
4		Write down the function of following instructions (a) ANL A,@R_1 (b) RLC A (c) MOVX A,@R_0	(3)
5		What is constant in embedded C?	(3)
6		Write an ALP to copy a block of 8 bytes of data to RAM locations starting at 80H from RAM locations 20H.	(3)
7		What is the difference between a Timer and Counter?	(3)
8		Explain the format of SCON Special Function Register.	(3)
9		Define Virtual memory.	(3)
10		Why does dynamic RAM need constant refreshing? How is this done?	(3)

PART B

(Answer one full question from each module, each question carries 14 marks)

Module -1

11	a)	Explain Non-restoring division algorithm with an example.	(8)
	b)	Explain Instruction Cycle with a sample timing diagram.	(6)
12	a)	Differentiate RISC and CISC Computer Architecture.	(7)
	b)	How does a computer go from a set of stored instructions to running them?	(7)

Module -2

13	a)	Draw and explain the architecture of 8051 microcontroller.	(9)
	b)	List the interrupts available in the 8051 microcontroller. Explain IE and IP Special Function register.	(5)

14 a) Explain different Addressing Modes of 8051 Microcontroller with examples. (8)

b) Explain TCON and TMOD special function register in 8051 Microcontroller. (6)

Module -3

15 a) Write an ALP to find the largest number in an array of 10 bytes, stored in the internal memory block starting with 21H. Store the result at 50H. (6)

b) Explain interfacing of stepper motor with microcontroller. Write an embedded C language program to rotate stepper motor in clockwise direction continuously in full step mode. (8)

16 a) Draw the block diagram to show how 8051 is connected to DAC 0808 at port P1. Write a program to generate Ramp signal. (8)

b) Write an 8051 C program to get a byte of data from Port P_1. If it is less than 100, send it to P_0; otherwise, send it to P_2. (6)

Module -4

17 a) Draw and explain ARM7 register architecture. (7)

b) Write an ALP to generate a square wave of frequency 100KHz on pin P1.0, using Timer 1 operating in mode 0. Assume Crystal frequency 11.0592 MHz (7)

18 a) Explain various System software. (8)

b) Write an embedded C program for the 8051 to transfer letter "A" serially at 9600 baud, continuously. (6)

Module -5

19 a) Explain different mapping techniques in cache memory. (8)

b) Explain the Asynchronous input/output transfer with proper timing diagram. (6)

20 a) Explain the address translation mechanism in Virtual Memory. (8)

b) Explain the working of DRAM and SRAM with neat diagram. (6)

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