Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth Semester B.Tech Degree Examination July 2021 (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		Explain the significance of accumulator, program counter and stack pointer in processor operation.	3
2		List the difference between RISC and CISC processors.	3
3		Describe the function of Program status word (PSW) in 8051 microcontroller.	3
4		List the interrupts of 8051 and its ROM locations.	3
5		Write an 8051 C program to send values 00-FF to port P1.	3
6		Write an 8051assembly language program to add two 8bit numbers stored in external RAM memory.	3
7		Explain the procedure of doubling the baud rate of data transfer in 8051 serial communication.	3
8		Assume XTAL=11.0592. Compute the value to be loaded into TH0 and TL0 (mode 1) to incorporate a time delay of 5ms.	3
9		Explain 'Locality of reference' in Cache memory system.	3
10		Differentiate SRAM and DRAM memory cells.	3

PART B

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

Module -1

11	a)	Illustrate the algorithm for division of two 4 bit signed binary numbers, -6/4. Write the algorithm or draw the flowchart also.	8
	b)	Explain the basic operations of a general processor in executing an instruction.	6
12	a)	Write down the range of numbers that can be represented using IEEE 754 single precision floating point representation. How do we represent zero, infinity and 49 in IEEE 754 format.	8
	b)	Draw the internal architecture of a general processor and explain the various components.	6

Module -2

13	a)	Explain the RAM memory organization of 8051microcontroller using a schematic diagram. Also list the 8051 Special function registers and its functions.	9
	b)	What is stack? Explain the role of stack in program execution during a CALL instruction.	5
14	a)	Explain about the ports of 8051 and also illustrate the Port 0 circuit read and write operation.	8
	b)	Explain the 'Rotate' instructions used in 8051 microcontroller.	6

Module -3

15	a)	Write an 8051 assembly language program to sort the ten numbers stored in memory locations 30H to 39H in ascending order. Comment all lines of the program.	8
	b)	Write an 8051 C code to convert the analog input provided to ADC chip to the digital value and store the result in memory location.	6
16	a)	Write an 8051 C program to send letters 'M', 'D' to LCD using delays.	7
	b)	Using a schematic diagram explain the procedure of interfacing KEYBOARD to 8051 microcontroller.	7

Module -4

17	a)	Explain the characteristics and operations of mode 1 programming of Timers in 8051 microcontroller.	6
	b)	Explain the steps to transfer data serially in 8051. Write an 8051 assembly language program to transfer 'Y' serially at baud rate 9600 continuously through Port 0.	8
18	a)	Explain ARM 7 register architecture.	8
	b)	Explain the operation of a) Assembler b) compiler c) Debugger	6

Module -5

19	a)	Explain programmed I/O and interrupt driven I/O for data transfer in computers.	8
	b)	Explain RAM and ROM memory chips.	6
20	a)	Explain associative mapping of cache memory for a 4K cache with block size 128 and word size 16. Draw necessary figures. Specify the main memory address.	8
	b)	Explain the memory hierarchy model using a layout diagram.	6

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