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Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

B.Tech Degree S4 (R,S) / S4 (WP) (R) / S2 (PT) (S, FE) Examination May 2024 (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 Von Neumann and Harvard Architecture	3
2		What is Stack Pointer, Program Counter and Accumulator	3
3		State how register bank selection is carried out in 8051.	3
4		Explain the following instructions a) ADDC A, 20H b) DIV AB c) DJNZ R0, Label	3
5		Write an assembly language program to copy 10 bytes starting from 20H to location starting from 50H.	3
6		Write an 8051 C program to send values 00H to FFH to port P1.	3
7		Draw the TMOD register and mention the function of each bit in the register.	3
8		Name the SFRs (any three) used for serial communication in 8051. What is their function?	3
9		What is meant by paging?	3
10		Draw the circuit diagram and explain the working of DRAM.	3

PART B

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

Module -1

11	a)	Represent the number -15.625 in IEEE754 single precision format	5
	b)	Draw the internal architecture of a general processor and explain the various components	9
12	a)	Perform the division 9/5 using any restoring division algorithm.	8
	b)	Explain the three major types of busses in a processor	6

Module -2

13	a)	Write the functions of the pins in 8051 - EA, RST, XTAL and ALE	8
	b)	Explain any three addressing modes used in 8051 with an example each.	6

14	a)	Describe the steps in executing an interrupt.	6
	b)	What are the alternative functions supported by Port 3 of 8051?	8

Module -3

15	a)	Write any five data types used in Embedded C	5
	b)	With necessary diagram explain interfacing of 8051 with DAC module and write assembly language program to generate a staircase waveform.	9
16	a)	Write an assembly language program to add three, 8-bit numbers stored in external RAM memory.	7
	b)	With a neat diagram explain how a Seven Segment Display can be interfaced with 8051 and write an assembly language program to display the character P.	7

Module -4

17	a)	Explain the different modes of operation of Timers in 8051.	8
	b)	Explain the operation of following System Software. a) Assembler b) Compiler c) Debugger	6
18	a)	Explain the steps to transfer data serially in 8051. Write an assembly language program to transfer "YES" serially at baud rate 9600 continuously through Port 0.	10
	b)	Describe CPSR of ARM processor.	4

Module -5

19	a)	Explain direct mapping of cache memory with an example	6
	b)	Explain the virtual memory address translation procedure with necessary diagram	8
20	a)	Differentiate between programmed I/O and interrupt driven I/O data transfer. Mention the advantages of Interrupt driven I/O.	9
	b)	Write a short note on memory hierarchy with block diagram	5

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