Reg.No.:												

VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 50019

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – NOV. / DEC. 2024
Third Semester
Computer Science and Engineering
U23CS305 – COMPUTER ORGANIZATION AND ARCHITECTURE
(Common to IT & CST)
(Regulation 2023)

Time: Three Hours | Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 – Evaluating
	K2 – Understanding	K4 – Analyzing	K6 – Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	State the purpose of bus system in digital computers.	2	K2	CO1
2.	Write a program to add two numbers using three instruction code format.	2	K2	CO1
3.	Write the steps to push an item to a register stack.	2	K2	CO2
4.	List the major characteristics of CISC Architecture.	2	K1	CO2
5.	Express -33 in signed two's complement form.	2	K3	CO3
6.	Give an example for Division Overflow.	2	K2	CO3
7.	Compare isolated input output and memory mapped input output.	2	K2	CO4
8.	Consider a system with one level of cache memory and a main memory. Access times of cache and main memory are 10 ns and 500 ns respectively. Compute the average access time if the hit ratio of cache memory is 80%?	2	K3	CO4
9.	Draw the vector processing pipeline to calculate the inner product in matrix multiplication.	2	K3	CO5
10.	Write the importance of Multi-core processors in gaming.	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.		Questions	Marks	KL	CO
11.	a)	Illustrate control unit of a basic computer with a timing diagram to show the relationship of control signals.	13	K2	CO1
		(OR)			
	b)	Outline various memory reference instructions along with the control signals and microoperations needed for the execution.	13	K2	CO1
12.	a)	Illustrate various addressing modes in processing.	13	K2	CO2
		(OR)			
	b)	Explain the characteristics of RISC Processor.	13	K2	CO2
13.	a)	Draw flowchart for Booth's algorithm and apply it solve the following: 10111 X 10011	13	K3	CO3
		(OR)			
	b)	Construct an arithmetic circuit that can perform basic arithmetic micro-operations such as addition, subtraction, complement, increment and decrement.	13	K3	CO3
14.	a)	Explain Direct Memory Access with a neat diagram.	13	K2	CO4
		(OR)			
	b)	Illustrate the hardware organization of associative memory and the logic to perform read and write operations.	13	K2	CO4
15.	a)	Outline the working of an instruction pipeline and examine its challenges.	13	K2	CO5
		(OR)			
	b)	Explain Multi-core processor architecture and its challenges.	13	K2	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.		Questions	Marks	KL	CO
16.	a)	A processor is connected to a keyboard and a monitor. The communication between these devices take place through an asynchronous communication interface. Analyze the control signals and components required for effective transmission and reception of data between the devices.	15	K4	CO4
		(OR)			
	b)	There are multiple IO devices connected to a system. Each device has different speed in transferring data to CPU. Analyze the possible methods for a CPU to handle requests from multiple devices using appropriate interrupt methods.	15	K4	CO4