Reg. No.												

Question Paper Code	21030

Sri SAI RAM INSTITUTE OF TECHNOLOGY

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B.E / B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2021

Fourth Semester

Common to CSE & IT

CS8491 – COMPUTER ARCHITECTURE

(Regulations 2017)

Duration: 3 Hours | Max. Marks: 100

Answer ALL Questions

PART-A (10 x 2 = 20 Marks)

1.	State Moore's law.	K1	CO1
2.	A favorite program runs in 10 seconds on computer A which has a 2GHZ clock. We have to design a computer B such that it can run the same program in 6 seconds. Determine the clock rate for computer B. Also assume that computer B requires 1.2 times as many clock cycles as computer A.	K3	CO2
3.	Multiply the given signed 2's complement numbers using bit pair recoding Multiplier= 011011 (+27) Multiplicand = 110101 (-11)	K3	CO3
4.	What is the need for carry look ahead adder?	K2	CO3
5.	Create a data path diagram for fetching the instruction from memory and incrementing the program counter.	K5	CO4
6.	Differentiate between data hazard and control hazard.	K4	CO4
7.	State Amdahl's law.	K1	CO5
8.	What is meant by hardware multithreading?	K1	CO5
9.	How will you evaluate or measure the performance of cache memory?	K6	CO6
10.	What is meant by bus arbitration?	K1	CO6

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 - Create

PART – B (5 x 13 = 65 marks)

11.	a)	Explain in detail about the functional units of a computer system.	13	K2	CO1
		OR			
	b)	What are the metrics involved in measuring the performance of a computer? Give examples.	13	K4	CO2
12.	a)	Explain the working of carry look ahead adder with a neat sketch.	13	K3	CO3
		OR			
	b)	Divide $(12)_{10}$ by $(3)_{10}$ using Restoring and Non restoring division algorithm with step by step intermediate results and explain.	13	K5	CO3
13.	a)	Draw and explain the data path for a branch instruction with necessary control lines	13	K6	CO4
		OR			
	b)	Explain in detail about the types of hazards in pipelining?	13	K2	CO5
14.	a)	Discuss about Flynn's classification in detail.	13	K2	CO5
		OR			
	b)	Write notes on hardware multithreading. Compare and contrast Fine grained multithreading with Coarse grained multithreading.	13	K2	CO5
15.	a)	Explain about bus arbitration schemes.	13	K1	CO6
		OR			
	b)	What is virtual memory? How can you implement virtual memory in a computer?	13	K1	CO6

PART C (1 X 15 = 15 Marks)

16.	a)	Write notes on Graphics processing units and shared memory multiprocessors with relevant examples. Also explain a scenario of where the above technologies can be used.	15	K2	CO5
		OR			
	b)	(i) A Block set associative cache memory consists of 128 blocks divided into four block sets. The main memory consists of 16,834 blocks and each block contains 256 -8 bit words. How many bits are required for addressing the main memory and how many bits are required to represent the TAG, SET & WORD fields?	8	K1	CO6
		(ii) Consider a direct mapped cache with 8 cache blocks(0-7).If the memory block requests are in the order 3,5,2,8,0,6,3,9,16,20,17,25,18,30,5,24.which of the following memory blocks will not be in the cache at the end of the sequence.	7	K1	CO6