SAVEETHA
INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES
(Declared as Deemed to be University under Section 3 of UGC Act 1956)

December - 2023

Programme : **B.E / B.Tech**

Course Code : **CSA12**

Course Name : **Computer Architecture**

Duration : **3 Hrs.**

Max Marks: **100**

Answer all the Questions

1	Describe the primary functionalities of stacks and queues, and provide an explanation for each operation	(10)	(CO1) (BL2)
2	Compare and contrast RISC and CISC architectures in terms of their design philosophies and performance characteristics.	(10)	(CO2) (BL2)
3	Compare the benefits and challenges of using static and dynamic scheduling techniques in superscalar processors.	(10)	(CO3) (BL2)
4	Describe in detail the architecture and features of a modern memory controller.	(10)	(CO4) (BL2)
5	Describe the challenges of managing shared resources, such as buses and memory, among multiple devices in a computer system.	(10)	(CO5) (BL2)
6	Conduct the multiplication of the numbers 0.00001 (in decimal) and 8192 (in decimal) in floating-point arithmetic. Subsequently, denormalize the result based on the IEEE 754 double-precision format (64 bits), and illustrate all the intermediate steps.	(10)	(CO1) (BL3)
7	Describe the concept of pipelining in processor architecture and how it enhances instruction throughput.	(10)	(CO2) (BL2)
8	Let's consider a pipeline with 5 phases having durations of 25, 35, 70, 60, and 90 ns. Given the latch delay is 18 ns, calculate the following: a) Pipeline cycle time b) Non-pipeline execution time c) Speed-up ratio d) Pipeline time for 600 tasks e) Sequential time for 600 tasks f) Throughput	(10)	(CO3) (BL3)
9	In a 2-way set associative cache memory unit with a capacity of 32 KB built using a block size of 16 words, where each word is 64 bits long, and the physical address space size is 8 GB, determine the number of bits allocated for the TAG field.	(10)	(CO4) (BL3)
10	Consider a pipelined processor with a 5-stage pipeline (IF - Instruction Fetch, ID -	(10)	(CO5) (BL4)

(All questions carry equal marks)