ROLL NO.: _____

COMPUTER ORGANIZATION AND ARCHITECTURE

CS301

Time Allotted: 1 hours **Full Marks: 30**

COs	BL	CO Statement
CO 1	Understand Evaluate Create	Illustrate the basic concept of computer architecture and its performance measurement, parallel processing, Flynn's classification and Amdahl's law and apply this knowledge in designing solutions for real life engineering problems.
CO 2	Understand	Summarize the basic concept of pipeline, instruction pipeline, arithmetic pipeline hazards detection and prevention and use this knowledge for designing and implementing mathematical and engineering problems leading to lifelong learning.
CO 3	Apply	Identify the concept of Instruction-Level Parallelism to solve engineering problems.
CO 4	Understand Apply Analyze	Illustrate and compare the concept of Multiprocessor architecture and parallel architecture and apply this knowledge for developing an approach by means of existing and new methods as a teamwork.
CO 5	Understand	Understand the concept of message passing architecture and interconnection network and design an optimized model for building a new solution as a professional engineering practice as a team.

Group – A
(Short Answer Type Questions)

Answer ***all*** from the following: **5 × 2 = 10**

		MARKS	CO	BL
1.	What is the primary function of the ALU in a CPU?	2	1	2
2.	State the IEEE 754 format for single-precision floating-point numbers.	2	1	5
3.	What is cache memory?	2	2	3
4.	What are the main types of primary memory?	2	2	3
5.	Explain the concept of virtual memory in brief.	2	3	3

Group – B
(Long Answer Type Questions)

Answer any ***four*** from the following: **4 × 5 = 20**

		MARKS	CO	BL
6.	Describe the different types of Addressing Modes with examples.	5	1	2
	OR			
	Explain the steps involved in the Instruction Cycle with a diagram.			
7.	Illustrate Booth's Algorithm for fixed-point multiplication with an example of 7 * (-6).	5	1	5
	OR			
	Explain the IEEE 754 format for floating-point number representation with an example of 1259.135.			

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8.	Evaluate the division operation on 12 / 5 using restoring division method.	5	1	6
	OR			
	Solve the division operation on 13 / 4 using non-restoring division method.			
9.	What are the different cache mapping techniques? Explain Direct Mapping, Fully Associative, and Set-Associative Mapping with examples.	5	4	4
	OR			
	Consider a direct mapped cache with block size 4 KB. The size of main memory is 16 GB and there are 10 bits in the tag. Find- 1. Size of cache memory 2. Tag directory size			
10.	Explain the Memory Hierarchy in computer systems with a diagram.	5	5	2
	OR			
	Compare and contrast RAM and ROM in terms of structure, usage, and functionality.			