Sub Code: R2331044A **R23** **Set No. 1**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY-GURUJADA VIZINAGARAM
III B. Tech I Semester Regular Examinations November -2025
COMPUTER ARCHITECTURE & ORGANIZATION
(ECE)

Time: 3 hours **Max. Marks: 70**

The Question paper consists of Part A & Part B.
Part A is compulsory, Answer all questions. Part B Answers any one question from each unit.

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1		PART-A	(20Marks)
	a)	Define Von Neumann Architecture.	[2]
	b)	What is the difference between fixed-point and floating-point representation?	[2]
	c)	What is an instruction cycle?	[2]
	d)	Define addressing modes with one example.	[2]
	e)	What is a micro-operation? Give one example.	[2]
	f)	Define register transfer language (RTL).	[2]
	g)	What is the difference between RAM and ROM?	[2]
	h)	Define cache memory.	[2]
	i)	Define memory-mapped I/O.	[2]
	j)	What is DMA (Direct Memory Access)?	[2]
		PART-B	(50Marks)
		Question from **Unit - I**	
2	a)	Represent +33 as signed 7-bit number using sign magnitude, signed 1's complement and signed 2's complement formats.	[5]
	b)	Explain the role of address bus, data bus, and control bus in a computer system.	[5]
		(OR)	
3	a)	What is a system bus? Describe its role in communication between CPU, memory, and I/O devices.	[5]
	b)	Given a 4-bit data 1011, show how the parity bit is generated and how the parity checker verifies it at the receiver.	[5]
		Question from **Unit - II**	
4	a)	Explain what memory-reference instructions are and give two examples.	[5]
	b)	Compare fixed-length and variable-length instruction formats, giving advantages of each.	[5]
		(OR)	
5	a)	Explain the following addressing modes with an example i) Register Indirect Addressing mode ii) Relative Addressing mode	[5]
	b)	Describe how pipelining differs in CISC and RISC architectures.	[5]
		Question from **Unit - III**	
6	a)	Explain bus and memory transfers with a neat diagram.	[5]
	b)	Describe control memory and its role in micro-programmed control.	[5]
		(OR)	
7	a)	Describe shift micro-operations and explain logical shift,	[5]

		arithmetic shift, and circular shift.	
	b)	Draw a block diagram of a control unit and explain the role of each component.	[5]
		Question from **Unit - IV**	
8	a)	Explain the differences between primary memory and secondary memory with examples.	[5]
	b)	Describe paging in virtual memory with an example.	[5]
		(OR)	
9	a)	Explain how cache memory improves system performance.	[5]
	b)	What is RAID? Describe its types and their applications.	[5]
		Question from **Unit - V**	
10	a)	Describe inter-processor arbitration and why it is needed.	[5]
	b)	Discuss the advantages and challenges of multiprocessor systems.	[5]
		(OR)	
11	a)	With a neat sketch explain the working principle of DMA	[5]
	b)	What are interconnection structures in multiprocessor systems? Explain their purpose.	[5]

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