

R.N.G.PATEL INSTITUTE OF TECHNOLOGY-RNGPIT
(An Autonomous Institute U/s UGC Act 1956)

B.Voc. SEMESTER-III, SEMESTER END EXAMINATION – WINTER 2025

SUBJECT CODE: 1SD301

DATE: 16-12-2025

**SUBJECT NAME: COMPUTER ORGANISATION &
ARCHITECTURE**

TIME: 11:00 AM to 01:00 PM

TOTAL MARKS: 50

Instructions

1. It is **compulsory** for students to write **Enrolment No. /Seat No.** on the question paper.
2. Attempt all questions in the question paper.
3. The figures to the right of each question indicate full marks. Make suitable assumptions with proper justification wherever required.
4. Simple, non-programmable scientific calculators are permitted.
5. BL - Cognitive Level (As per Revised Bloom's Taxonomy) (R-Remember, U-Understanding, A –Application, N –Analyze, E – Evaluate, C -Create), CO - Course Outcomes.

		Marks	BL	CO
Q.1	(a) Define RTL. Give an example of register transfer of data through an accumulator.	05	R	1
	(b) List all registers used in 'Basic Computer' including their symbolic name, size and functionality.	05	R	1
Q.2	(a) Explain the role of the following registers in instruction execution: Program Counter (PC), Instruction Register (IR), and Address Register (AR).	05	U	2
	(b) Apply BUN instruction in assembly program that needs to use a looped sub routine to check a flag.	05	A	2
OR				
Q.2	(a) Explain Instruction cycle with flowchart.	05	U	2
	(b) Illustrate the following instructions: INP, ISZ and LDA	05	A	2
Q.3	(a) Draw and explain the block diagram of a microprogrammed control unit, highlighting control memory, control address register, sequencer, and control data register.	05	U	3
	(b) Compute an assembly language program to add 50 numbers stored in memory using a loop (accumulator-based model).	05	A	3
OR				
Q.3	(a) Explain Control Unit diagram for basic computer.	05	U	3

	(b)	Illustrate micro-operations using register/memory stack to implement CALL and RETURN operations.	05	A	3
Q.4	(a)	Explain Flynn's taxonomy with an example.	05	U	4
	(b)	Write a program in assembly language to multiply two numbers in registers B and C in case the processor has only ADD instruction.	05	A	4
		OR			
Q.4	(a)	Explain register stack and memory stack organizations.	05	U	4
	(b)	Write a program to evaluate $X = (a*b)/c+d$ in two address and three address instruction formats.	05	A	4
Q.5	(a)	Explain the concept of an I/O interface.	05	U	5
	(b)	What is virtual memory? Describe relation between address space and memory space in virtual memory system.	05	R	5
		OR			
Q.5	(a)	Explain Direct Memory Access (DMA).	05	U	5
	(b)	Describe arithmetic pipeline.	05	R	5
