PVP 23

Code: 23AM3403, 23DS3403

II B.Tech - II Semester – Supplementary Examinations
DECEMBER 2025

DIGITAL LOGIC AND COMPUTER ORGANIZATION

(Common for AIML, DS)

Duration: 3 hours Max. Marks: 70

Note: 1. This question paper contains two Parts A and B.
2. Part-A contains 10 short answer questions. Each Question carries 2 Marks.
3. Part-B contains 5 essay questions with an internal choice from each unit. Each Question carries 10 marks.
4. All parts of Question paper must be answered in one place.

PART – A

1.a)	What is the hexadecimal equivalent of $(11001111)_2$?
1.b)	How many rows are there in a truth table for a 4-variable Boolean function?
1.c)	List any two examples of combinational circuits.
1.d)	Name the different types of shift registers.
1.e)	Define zero-address instruction format with an example.
1.f)	What is Booth's multiplication algorithm?
1.g)	What is main memory and why is it called primary memory?
1.h)	What is a page fault in virtual memory?
1.i)	Differentiate between synchronous and asynchronous data transfer.
1.j)	Define cycle stealing in DMA.

PART – B

			Max. Marks
UNIT-I			
2	a)	Convert $(753)_8$ to binary, decimal and hexadecimal.	5 M
	b)	Perform binary subtraction using the 2's complement method for $(19 - 25)_{10}$.	5 M
OR			
3	a)	Convert the Boolean function F(A, B, C) = AB + A'C into Canonical SOP and POS forms.	5 M
	b)	Discuss the real-life applications of POS simplification in digital circuit design.	5 M
UNIT-II			
4	a)	Explain the working of a half adder with circuit diagram, truth table and Boolean expressions.	5 M
	b)	Differentiate between multiplexer and De-multiplexer with applications.	5 M
OR			
5	a)	Describe the importance of latches in memory elements.	5 M
	b)	What is a T flip-flop? Derive its truth table and explain its working with a logic diagram.	5 M
UNIT-III			
6	a)	Compare general-purpose registers and special-purpose registers with examples.	5 M
	b)	What is an addressing mode? Explain different types of addressing modes with examples.	5 M

OR			
7	a)	Describe the carry and borrow concepts in binary subtraction with an example.	5 M
	b)	What is a Decimal Arithmetic Unit (DAU)? Explain its components.	5 M
UNIT-IV			
8	a)	Discuss the role of registers and cache memory in the memory hierarchy.	5 M
	b)	Explain about Locality of Reference.	5 M
OR			
9	a)	What is magnetic storage? Discuss its working principle with an example.	5 M
	b)	Describe the role of tag fields in associative memory mapping.	5 M
UNIT-V			
10	a)	Explain how data transfer occurs between peripheral devices and the CPU.	5 M
	b)	Compare and contrast serial and parallel communication in I/O devices.	5 M
OR			
11	a)	What is a strobe control method in asynchronous data transfer? Explain with a diagram.	5 M
	b)	Explain the need for a priority interrupt system in computers.	5 M