PVP 23

Code: 23AM3403, 23DS3403

II B.Tech - II Semester – Regular Examinations - MAY 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.

BL – Blooms Level CO – Course Outcome

PART – A

		BL	CO
1.a)	Convert $(1101101)_2$ to octal.	L2	CO1
1.b)	Give an example of a don't care condition in a K-map.	L2	CO1
1.c)	Write the Boolean expressions for sum and carry in a half adder.	L2	CO1
1.d)	Difference between latch and flip-flop.	L2	CO1
1.e)	How does a Cache improve CPU performance?	L2	CO1
1.f)	What is the function of a full adder?	L2	CO1
1.g)	Arrange the following memory types in order of speed: Cache, RAM, Hard Disk, Registers.	L2	CO1
1.h)	What is content-addressable memory (CAM)?	L2	CO1
1.i)	What are peripheral devices? Give two examples.	L2	CO1
1.j)	Define vector and non-vector interrupts.	L2	CO1

PART – B

			BL	CO	Max. Marks
UNIT-I					
2	a)	Convert $(2F)_{16}$ into decimal.	L3	CO3	5 M
	b)	Convert $(10110110)_2$ to Excess-3 code and BCD 8-4-2-1.	L3	CO3	5 M
OR					
3	a)	State and prove De Morgan's Theorems with truth tables.	L2	CO1	5 M
	b)	Draw and simplify the Boolean function F(A, B, C) = Σ(0, 1, 3, 4, 6) using a 3-variable K-map.	L4	CO4	5 M
UNIT-II					
4	a)	Explain the steps involved in analyzing a combinational circuit with an example.	L2	CO1	5 M
	b)	Discuss about encoders and decoders.	L2	CO1	5 M
OR					
5	a)	Explain the working of a JK flip-flop with a truth table and circuit diagram.	L2	CO1	5 M
	b)	Describe the parallel-in parallel-out (PIPO) shift register with an example.	L2	CO1	5 M
UNIT-III					
6	a)	Discuss the role of stack organization in recursive function execution.	L3	CO2	5 M
	b)	Compare zero-address, one-address, two-address, and three-address instruction formats.	L3	CO2	5 M

OR					
7	a)	Describe Booth's multiplication algorithm and perform the multiplication of (-5) × (3) using Booth's method.	L3	CO3	5 M
	b)	Explain the addition operation of sign magnitude data with examples.	L2	CO1	5 M
UNIT-IV					
8	a)	Explain the difference between SRAM and DRAM in terms of working, speed, and cost.	L2	CO1	5 M
	b)	Discuss about Associative memory.	L2	CO1	5 M
OR					
9	a)	Differentiate between direct-mapped cache, fully associative cache, and set-associative cache.	L4	CO4	5 M
	b)	Discuss the role of page tables in virtual memory management.	L2	CO1	5 M
UNIT-V					
10	a)	Explain how data transfer occurs between peripheral devices and the CPU.	L2	CO1	5 M
	b)	Differentiate between memory-mapped I/O and I/O-mapped I/O with an example.	L4	CO4	5 M
OR					
11	a)	Discuss the Asynchronous data transfer.	L2	CO1	5 M
	b)	Explain the working of a DMA controller with a block diagram.	L2	CO1	5 M