

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

M.E DEGREE END SEMESTER THEORY EXAMINATIONS, NOV/DEC 2025

First Semester

Applied Electronics

PAPT2404 - Digital CMOS VLSI Design

Regulations - 2024

Duration : 3 Hrs

Maximum Marks: 100

PART - A (ANSWER ALL QUESTIONS) (Marks 10*2=20)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
1.	List the concept hierarchy and abstraction in VLSI design.	L1	1	2
2.	Define Elmore constant.	L1	1	2
3.	How interconnect delay is calculated in digital circuits?	L2	2	2
4.	Implement $Y = \overline{(A+B)} \cdot C$ in pass transistor logic.	L3	2	2
5.	Differentiate static and dynamic latches.	L2	3	2
6.	Define clock skew and clock jitter.	L1	3	2
7.	Mention the uses of Shifters.	L1	4	2
8.	Mention the needs of accumulator in the data path implementation.	L2	4	2
9.	Differentiate volatile and non-volatile memory.	L2	5	2
10.	Classify the types of ROM.	L1	5	2

PART - B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)

<i>Q.No</i>	<i>Questions</i>	<i>BLT</i>	<i>CO</i>	<i>Marks</i>
11.	a i Briefly explain the static characteristics of CMOS inverter.	L2	1	8
	ii Give short notes on Stick and layout diagram.	L2	1	8
	Or			
	b Describe the various methods to minimize the static and dynamic power dissipation.	L2	1	16
12.	a Compare CMOS logic Inverter and Pseudo NMOS Logic inverter; list the drawbacks of Pseudo NMOS Logic over CMOS logic.	L3	2	16
	Or			
	b How static and dynamic properties of complex gates were used in the design of combinational logic circuits.	L3	2	16
13.	a Implement a latch circuit and register circuit using static CMOS design style.	L3	3	16
	Or			
	b Implement different clocking strategies to the sequential circuits and compare their performance.	L3	3	16

14.	a	Design a 4x4 array multiplier to multiply 12x24.	L4	4	16
		Or			
	b	Design a 2-bit shifter to shift the words both in left and right directions.	L4	4	16
15.	a	Draw the functional diagram of 6 Transistor SRAM cell and its operation.	L2	5	16
		Or			
	b	Describe about Leakage currents in DRAM cell and explain why refreshment is needed periodically.	L2	5	16