



**B.Tech - Odd Sem : End Semester Exam**  
**Academic Year:2020-2021**  
**18EC2208FC - VLSI Design**  
**Set No: 1**

<b>Time:</b>		<b>Max.Marks: 100</b>					
S.NO	Answer All Questions	Choice	Options	Marks	CO	CO BTL	COI BTL
1.	Draw the physical structure of N-channel enhancement-type MOSFET and explain its output characteristics.	choice Q-2		10Marks	CO1	1	1
2.	Discuss about basic silicon planar process			10Marks	CO1	1	1
3.	Answer either 3.Q or 4.Q	choice Q-4		15Marks	CO1	1	1
3.A.	Draw the PMOS fabrication and explain step wise process			8Marks	CO1	1	1
3.B.	Draw the BiCMOS structure process			7Marks	CO1	1	1
4.	Answer either 3.Q or 4.Q			15Marks	CO1	1	1
4.A.	Draw the NMOS fabrication and explain each process			8Marks	CO2	2	1
4.B.	Draw the Twin tub process			7Marks	CO1	1	1
5.	Give a note on Transconductance.	choice Q-6		10Marks	CO2	2	1
6.	How threshold voltage effect on transistor			10Marks	CO2	2	2
7.	Answer either 7.Q or 8.Q	choice Q-8		15Marks	CO2	2	2
7.A.	Derive the non-saturation region IDS equation upto beta ( $\beta$ )			8Marks	CO2	2	1
7.B.	Draw the structures of BiCMOS inverter			7Marks	CO2	2	2
8.	Answer either 7.Q or 8.Q			15Marks	CO2	2	2
8.A.	Derive the saturation region IDS equation upto beta ( $\beta$ )			8Marks	CO2	2	1
8.B.	What is the importance of Body effect in MOSFET			7Marks	CO2	2	2
9.	Draw the stick diagram for CMOS inverter	choice Q-10		10Marks	CO3	3	1
10.	Draw the stick diagram for NMOS inverter			10Marks	CO3	3	1
11.	Answer either 11.Q or 12.Q	choice Q-12		15Marks	CO3	3	3
11.A.	Design the schematic, stick diagram and layout for $Y = [(A+B)(C+D)]'$ using CMOS technology			8Marks	CO3	3	3
11.B.	Design NAND using Pass transistor			7Marks	CO3	3	3
12.	Answer either 11.Q or 12.Q			15Marks	CO3	3	3
12.A.	Illustrate the rules of lambda based for transistors and wires			8Marks	CO3	3	2
12.B.	Design NOR using Pass transistor			7Marks	CO3	3	3
13.	Discuss about sheet resistance	choice Q-14		10Marks	CO4	2	2
14.	Calculate the Standard unit of capacitance for 5um			10Marks	CO4	2	2

15.	Answer either 15.Q or 16.Q	choice Q-16		15Marks	CO4	2	2
15.A.	Illustrate the struck-at faults to occur in CMOS VLSI circuits			8Marks	CO4	2	2
15.B.	Explain with suitable logic diagram and truth table			7Marks	CO4	2	2
16.	Answer either 15.Q or 16.Q			15Marks	CO4	2	2
16.A.	Discuss about Fault models			8Marks	CO4	2	2
16.B.	Disucss about Automatic test pattern Generation			7Marks	CO4	2	2

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