Hall Ticket No.: | | | | | | | | | | |

Set-1

Course Code: **23MTVLT01**

MALINENI LAKSHMAIAH WOMEN'S ENGINEERING COLLEGE

(AUTONOMOUS)

I - M.Tech. I - Semester (MR23) Regular Examinations, March - 2024

CMOS ANALOG IC DESIGN

Department of Electronics & Communication Engineering

Time: 3 hours Max. Marks: 75

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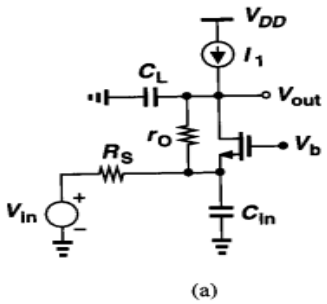
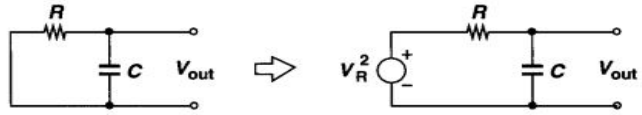
*Answer **ALL** the questions – **5*15=75 Marks***

Q. No.		Question	Marks	CO	BL
1	a)	Explain about Short channel Effects for MOS Transistor.	(7M)	CO1	L3
	b)	Derive the expression for I/V Characteristics of MOS Transistor and obtain the relationship between I_D of MOSFET and its terminal voltage.	(8M)	CO1	L4
		(OR)			
2	a)	Using small signal analysis, Derive an expression for the output resistance of the cascode current source.	(8M)	CO1	L3
	b)	With necessary schematics, obtain the small-signal model of CS stage including transistor output resistance.	(7M)	CO1	L4
3	a	Explain why the Gilbert cell can operate as an analog voltage multiplier.	(8M)	CO2	L3
	b	Sketch the Input-Output characteristics of a differential pair and explain its operation.	(7M)	CO2	L4
		(OR)			
4	a	With relevant expression of active current mirror signal of the differential pair with current-source load and calculate the value of g_m and R_{out}	(8M)	CO2	L3
	b	Discuss about the Common-mode properties of the differential pair with active current mirror	(7M)	CO2	L3
5	a	Explain about the high frequency model of common-source stage and sketch the characteristics	(7M)	CO3	L4
	b	For the common-gate stage shown in Fig(a),calculate the transfer function and the input impedance , Z_{in}. Explain why Z_{in} becomes independent of C_L as the capacitance increases  (a)	(8M)	CO3	L4

		(OR)			
6	a	Explain about the different types of Noises generated in Integrated Circuits	(8M)	CO3	L4
	b	Consider the RC circuit shown in fig (b), calculate the noise spectrum and the total noise power in V_{out} 	(7M)	CO3	L3

7	a	Discuss briefly about the different Feedback topologies with necessary Schematics	(15M)	CO4	L3
		(OR)			
8	a	Explain about Two-stage opamp with single-ended output with neat sketch	(7M)	CO4	L3
	b	State and discuss about the Slew rate in the linear op amp circuit	(8M)	CO4	L3

9	a	what is a comparator and list the important characteristics of a comparator	(8M)	CO5	L4
	b	Explain about Open loop comparator	(7M)	CO5	L4
		(OR)			
10	a	With relevant schematics explain about discrete-time comparators.	(8M)	CO5	L3
	b	How to improve the performance of an open loop high gain comparator by auto zeroing?	(7M)	CO5	L3

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