

- (b) Give an account of charge injection errors in connection with comparators and suggest a method to minimize the same.

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No. of Printed Pages : 04

Roll No.

BB-761

M. Tech. EXAMINATION, May 2018

(Second Semester)

(B. Scheme) (Main & Re-appear)

ECE(VLSI)

MTVLSI502

ANALOG CMOS IC DESIGN

Time : 3 Hours]

[Maximum Marks : 75

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

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P.T.O.

Unit I

1. (a) Choose values of $V_{GS} = 1, 2, 3, 4$ and $5V$, assume that the channel modulation parameter is zero. Sketch to scale the output characteristics of an enhancement n-channel device if $V_T = 0.7 V$ and $I_D = 500 \mu A$ when $V_{GS} = 5 V_{ds}$ saturation. **7**
- (b) Derive an expression for g_m of an N-channel MOSFET operating in linear and saturation regions. **8**
2. (a) Discuss the transfer characteristics of the MOS and the mode of operation in each region. **6**
- (b) Explain the MOSFET as a switch. **9**

Unit II

3. (a) Explain in detail the design and operation of Wilson Current mirror. **7**
- (b) Explain in detail the design and operation of cascade current mirror with necessary equations. Identify the limitations and suggest remedies. **8**

4. (a) Explain, why source follower circuit exhibits large amounts of overshoot and ringing. **5**
- (b) Give the relative performance of CS, CG, CD amplifiers. **10**

Unit III

5. (a) Deduce the necessary condition that ensures zero input-offset voltage for a 2 stage OP amp. **6**
- (b) Explain about various OPAMP characteristic and applications. **9**
6. Explain the effect of negative feedback on the frequency response of OP-AMP. **15**

Unit IV

7. What is a comparator ? List the important characteristics of the comparator. **15**
8. (a) Draw the circuit of switched capacitor circuit and explain its principle. **9**