Question Paper

Exam Date & Time: 24-Nov-2018 (10:00 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

SCHOOL OF INFORMATION SCIENCES

SECOND SEMESTER MASTER OF ENGINEERING - ME (VLSI DESIGN)

Advanced VLSI Design [EDA 604]

Marks: 100 **Duration: 180 mins.**

END SEMESTER DEGREE EXAMINATION NOVEMBER 2018

Answer all the questions.

1) What are the different ways of fabricating capacitors in CMOS VLSI process? Compare each of them. (10)

2) With diagram, explain a basic current mirror using MOSFETs, taking into account the channel length modulation. (10)

3) Design a current sink to sink a current of 10 μA. Estimate the minimum voltage across the current sink and the output resistance. (10)

[Data given: V_{DD} = +5V, V_{SS} = 0V, L = 5μm, V_{GS} = 1.2V, V_{th} = 0.83V, Lambda = 0.06/V, K_n = 50μA/V^2]

4) With the help of a schematic diagram and a small-signal equivalent circuit, obtain the expression for the small-signal incremental voltage gain, Av for a CMOS Common-Source amplifier with passive resistor load. (10)

5) With the help of a small-signal equivalent circuit, obtain the expression for Av of a CMOS Common-Gate amplifier with passive resistor load. Assume finite output impedance r_0 and signal source impedance R_s. (10)

6) Draw a neat schematic and explain the Thermal Voltage Referenced Self-Biasing circuit. (10)

7) What is Common Mode Range (CMR) of a differential amplifier? Explain, with diagram, how do you measure it? (10)

8) What are the advantages of switched-capacitor circuits? With the help of a simple diagram, explain a switched- (10)

capacitor resistor circuit.

9) With neat diagrams, explain Analog Multiplying Circuit using Squaring Circuit. (10)

10) With the help of neat diagrams, explain the working of Cyclic DAC and Pipeline DAC. (10)

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