Reg. No.										

MANIPAL UNIVERSITY
SCHOOL OF INFORMATION SCIENCES

SECOND SEMESTER MASTER OF ENGINEERING – **ME** (VLSI DESIGN)
DEGREE EXAMINATION – APRIL / MAY 2016

SUBJECT: EDA 604: ADVANCED VLSI DESIGN

Wednesday, May 4, 2016

Time: 10.00 – 13.00 Hrs. Max. Marks: 100

1. What are the different ways of fabricating capacitors in CMOS VLSI process? Compare each of them.
(10 marks)
2. With diagram, explain a basic current mirror using MOSFETs, taking into account the channel length modulation.
(10 marks)
3. Design a ***current sink*** to sink a current of 10μA. Estimate the minimum voltage across the current sink and the output resistance.
[Data: $V_{DD} = +5V$, $Vss = 0V$, $L = 5\mu m$, $V_{GS} = 1.2V$, $V_{th} = 0.83V$, $\lambda = 0.06/V$, $Kn = 50\mu A/V^2$]
(10 marks)
4. With the help of a schematic diagram and a small-signal equivalent circuit, obtain the expression for the small-signal incremental voltage gain, $\mathbf{A_v}$ of a CMOS Common-Source amplifier with passive resistor load.
(10 marks)
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 marks)
6. Draw a neat schematic and explain the Thermal Voltage Referenced Self-Biasing circuit.
(10 marks)
7. What is Common Mode Range (CMR) of a differential amplifier? Explain, with diagram, how do you measure it?
(10 marks)
8. What are the advantages of switched-*capacitor* circuits? With the help of a simple diagram, explain a *switched-capacitor* resistor circuit.
(10 marks)
9. With neat diagrams, explain Analog Multiplying Circuit using Squaring Circuit.
(10 marks)
10. With the help of neat diagrams, explain the working of Cyclic DAC and Pipeline DAC.
(10 marks)

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