

Roll
No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

B.E / B.Tech (Full-Time) DEGREE END SEMESTER EXAMINATIONS, APR / MAY 2014

**ELECTRONICS AND COMMUNICATION ENGINEERING ENGINEERING
VII Semester**

EC 9076 CMOS ANALOG IC DESIGN II

(Regulation – 2008)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Show that the difference between V_{BE} of two BJTs is PTAT.
2. State the purpose of using startup circuit in self-biased circuits.
3. Define SFDR.
4. Give the expression for the equivalent resistance of a MOS transistor used as resistor.
5. Define DNL.
6. Draw the circuit diagram of a latch used as a comparator.
7. What is meant by bottom plate sampling?
8. Write the expression for cutoff frequency of low pass filter used in a DSM.
9. Define PSRR.
10. What are guard rings?

PART-B (5 x 16 = 80 Marks)

11. Derive a bandgap reference circuit and show that the output voltage of the bandgap reference exhibits zero TC. (16)
12. a. i. Derive an integrator using switched capacitor circuit. (8)
ii. Explain the techniques that are adopted in a switched capacitor integrator circuit to minimize charge injection issues. (8)
(OR)
- 12.b Derive harmonic distortion components arising due to nonlinear MOS sampling switch and explain a circuit technique that can be incorporated in the MOS switch to make it linear. (16)
13. a. i. Explain the principle of operation of latched comparator by means of its VTC. (6)
ii. Discuss the issue of offset in latched comparator and explain the circuit technique employed to minimize offset. (10)
(OR)
- 13 b. Draw a 3-bit Successive Approximation ADC and explain its various modes of operation using charge conservation principle. (16)

14. a. Derive the signal and noise transfer function of a first order SDM and compare the inband signal power to quantization noise power ratio with a nyquist rate ADC. (16)

(OR)

14. b. Explain the principle of operation of SDM ADC and derive a stable second order SDM. (16)

15. a. i. Explain the issues and sources of substrate coupling in mixed signal environment. (8)

ii. Explain the techniques adopted in mixed signal circuits to minimize substrate coupling. (8)

(OR)

15b. i. Explain the shielding technique employed in mixed signal circuits to minimize cross talk. (8)

ii. What are supply and ground bounces?. Explain a technique to minimize supply bounces in mixed signal circuits. (8)