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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
EIGHTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EC462
Course Name: MIXED SIGNAL CIRCUIT DESIGN

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) Derive the voltage gain and output impedance of source follower. (8)
- b) Draw and explain folded cascode configuration and list out its advantages. (7)
- 2 a) Explain the working and derive the output impedance of a simple MOS current mirror. (7)
- b) Derive the output impedance of differential amplifier with MOS current source load. (8)
- 3 a) What is the effect of source degeneration resistor in a common source amplifier? (5)
- b) Derive the output impedance of MOS telescopic cascode differential amplifier. (10)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) What is miller compensation ? How it is implemented in a 2-stage op-amp? (10)
- b) Derive the expression for the gain of a 2-stage op-amp. (5)
- 5 a) Quantitatively explain the working of a supply independent reference circuit. (8)
- b) Draw the block diagram of a charge pump PLL and explain the functions of each block. (7)
- 6 a) With neat circuit diagram, explain two stage open loop comparator circuit. (8)
- b) What is the principle behind band gap reference in analog integrated circuits? (7)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Quantitatively explain charge injection and clock-feedthrough in MOS switch. (10)
- b) Draw the circuit diagram and explain the working of a Switched Capacitor (SC) integrator. (10)

- 8 a) What are the specifications of a DAC? Explain any four in detail. (10)
b) Draw the circuit diagram of a pipeline ADC and explain its operation. (10)
- 9 a) With neat diagram, explain the working of a sample and hold circuit. (10)
b) Draw the circuit diagram of a R-2R DAC and explain its operation. (10)
