

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION(R&S), MAY 2019

Course Code: EC204

Course Name: ANALOG INTEGRATED CIRCUITS (AE, EC)

Max. Marks: 100

Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks.

Marks

- 1 a) Derive the equation for closed loop voltage gain, input resistance with feedback, output resistance with feedback and total output offset voltage with feedback of a voltage series feedback amplifier. (10)
- b) Define slew rate. What are its causes? Derive the equation for maximum input frequency at which an undistorted signal is obtained in terms of slew rate? (5)
- 2 a) Design an inverting adder circuit using opamp to get the output expression as $V_0 = -(0.2V_1 + 2V_2 + 20V_3)$, where V_1 , V_2 and V_3 are the inputs. (7)
- b) Derive the equation for the output voltage for an averaging circuit using opamp. (8)
- 3 a) Draw the equivalent circuit of an operational amplifier. Explain voltage transfer characteristics of an operational amplifier. (8)
- b) Define a) Power Supply Rejection Ratio b) Input Offset Current (7)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) Explain the working of full wave precision rectifier. (9)
- b) Derive the equation for output voltage of an integrator. Why is it called a lossy integrator? (6)
- 5 a) Explain how switching takes place at UTP and LTP in a Schmitt trigger. Plot the hysteresis curve. (10)
- b) What is a zero crossing detector? (5)
- 6 a) Design a first order low pass filter at a cut-off frequency of 2kHz with a pass band gain of 3 (8)
- b) Prove that the input voltage is converted into corresponding output current in a voltage to current converter with floating load. (7)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Explain the operation of Phase Locked Loop. What is lock range and capture range? (10)
- b) With the help of internal diagram explain the monostable operation of timer IC 555. Draw the input and different output waveforms. Derive the equation for pulse width. (10)
- 8 a) Explain the working of successive approximation ADC (10)
- b) Discuss the operation of dual slope ADC (10)
- 9 a) What is a sample and hold circuit (5)
- b) Discuss how digital signal is converted into analog signal in a weighted resistor DAC. (6)
- c) Explain the internal diagram of I.C. 723 (6)
- d) Explain how current boosting is achieved using I.C 723 (3)
