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=--(0.2V1+2V2+20 V3) , where V1, V2 and V3 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)

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