

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID :131668

Roll No. 

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

**B. TECH.**

**Theory Examination (Semester-VI) 2015-16**

**ANALOG SIGNAL PROCESSING**

*Time : 3 Hours*

*Max. Marks : 100*

**Section-A**

**1. Attempt each short answer type questions. (10×2=20)**

- (a) Draw the circuit of op-amp as zero crossing detectors.
- (b) Draw the circuit diagram and write the transfer function of a first order all pass filter.
- (c) Comment on voltage feedback amplifier.
- (d) What do you mean by nuller.
- (e) Comment on Bruton's FDNR technique.
- (f) Give the idea on single amplifier biquad.

- (g) Give idea on delay equalization
- (h) What is Operational Transconductance Amplifier.
- (i) Give an idea on current conveyor
- (j) Give an idea on analog signal filtering.

### Section-B

2. Attempt any five parts of the following. (10×5=50)

- (a) Draw and explain the Voltage series feedback amplifier. Derive the closed loop voltage gain.
- (b) Explain in detail about Bruton's FDNR technique.
- (c) Explain the working of op-amp as an amplitude demodulator.
- (d) Explain the working of op-amp as peak detector.
- (e) Draw the circuit of a generalized impedance convertor (GIC).
- (f) Realize a grounded inductance using GIC and find its value.

- (g) What is a negative impedance convertor. Draw circuit diagram and find the input impedance.
- (h) Explain basic comparator with its input and output waveforms.

### Section-C

**Note: Attempt any two parts of the following. (15×2=30)**

3. (a) A first order active high pass filter has a pass band gain of two and a cut-off corner frequency of 1 kHz. If the input capacitor has a value of 10 nF, calculate the value of the cut-off frequency determining resistor and the gain resistors in the feedback network.  
Also plot its frequency response curve.
- (b) Draw the circuit of a passive second order High Pass filter Resistance, Inductance and Capacitance. Convert the same to an active filter using OTA.
4. Describe in detail process of second order realization and various design parameters.
5. Briefly explain the design and magnitude response of Butterworth filter.