

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

PAPER ID : 2481

Roll No.

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B.Tech.

(SEMESTER-VI) THEORY EXAMINATION, 2012-13

ANALOG SIGNAL PROCESSING

Time : 2 Hours]

[Total Marks : 50

SECTION – A

1. Attempt all parts. **5 × 2 = 10**
- How do you compensate input error sources in op-amp ?
 - Draw the circuit of op-amp as zero crossing detectors.
 - Give differences between active and passive filters.
 - Draw the circuit diagram and write the transfer function of a first order all pass filter.
 - Give principal difference between Operational amplifier and Operational Transconductance Amplifier.

SECTION – B

2. Attempt any **three** parts. **5 × 3 = 15**
- 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.
 - Explain the working of op-amp based Schmitt trigger and explain how it provides noise immunity. Also explain how Schmitt triggers can be used for eliminating comparator chatter.
 - Explain the working of log amplifier in transdiode configuration and obtain the expression for output voltage.
 - Draw the circuit of a passive second order High Pass filter using Resistance, Inductance and Capacitance. Convert the same to an active filter using OTA.
 - Give the draw backs of zener based clamping amplifier. Explain the circuit techniques to overcome these drawbacks.

2481



2481

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SECTION – C

Attempt **all** questions in this section.

5 × 5 = 25

3. Draw the circuit diagram of an ideal integrator using op-amp, list the drawbacks of the same and suggest solution to overcome the same.

OR

Draw the circuit diagram of KHN-biquad. Find the transfer function of band reject, band pass and all pass functions. Also draw the phase plot of all pass function.

4. Explain the working of op-amp as an amplitude demodulator.

OR

Explain the working of op-amp as peak detector.

5. Draw the circuit of capacitance multiplier and find the equivalent circuit of the impedance you obtain.

OR

Draw and find the transfer function of basic voltage amplifier using OTA.

6. Explain the working of op-amp based NIC with proper circuit diagram and equations.

OR

Explain the concept of gyrator. Simulate an inductor using OTA (single ended). Draw its differential realization.

7. Draw the circuit diagram of full wave precision rectifier using op-amps also plot its V-I characteristic.

OR

Synthesize the circuit given below using OTA.

