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B.TECH.
THEORY EXAMINATION (SEM–VI) 2016-17
ANALOG SIGNAL PROCESSING

Time : 3 Hours *Max. Marks : 100*

Note : *Be precise in your answer. In case of numerical problem assume data wherever not provided.*

SECTION-A

1 **Explain the following:** **(10×2=20)**

a) Voltage Feedback Amplifier
b) Transconductance Amplifier
c) Current Conveyor
d) Filter Realization
e) General Impedance Convertor circuit
f) Properties of Lossless ladders
g) GIC
h) Realization of simple ladders
i) Filter Design Parameters
j) Analog Signal Filtering

SECTION-B

2 **Attempt any five of the following:** **(10×5=50)**

a) Explain the working of op-amp as an amplitude demodulator and op-amp as peak detector.

b) Draw the circuit of capacitance multiplier and find the equivalent circuit of theimpedance you obtain.

c) How do you compensate input error sources in op-amp? Explain in detail. Draw and find the transfer function basic voltage amplifier using OTA.

d) Draw the circuit diagram of full wave precision rectifier using op-amps also plot its V-Icharacteristic.

e) 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.

f) Explain with suitable diagram of Buttreworth and Chebyshev magnitude response.

g) Define with suitable diagram of Gorski-Popiel's Embedding Technique,Bruton's FDNR technique.

h) What do mean by Bode sensitivity and Delay equalization? Explain with an example.

SECTION-C

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

3. Using OTAs draw the circuit which realizes a grounded inductor and floating inductor and derive the expression for equivalent inductances. Also explain the operation of a voltage limiter circuit with the help of a neatly labeled circuit diagram.

4. Explain the effect of finite gain of op-amp with suitable example. 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.

5. Write short note of the following with suitable diagram:

a. First-order and Second-order filter Realization

b. Strategies for Equalization Design