

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)
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|--|-----------------------------------|
| a) Voltage Feedback Amplifier | f) Properties of Lossless ladders |
| b) Transconductance Amplifier | g) GIC |
| c) Current Conveyor | h) Realization of simple ladders |
| d) Filter Realization | i) Filter Design Parameters |
| e) General Impedance Convertor circuit | 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 the impedance 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-I characteristic.
 - 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 Butterworth 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