

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)**
- Explain the working of op-amp as an amplitude demodulator and op-amp as peak detector.
 - Draw the circuit of capacitance multiplier and find the equivalent circuit of the impedance you obtain.
 - How do you compensate input error sources in op-amp? Explain in detail. Draw and find the transfer function basic voltage amplifier using OTA.
 - Draw the circuit diagram of full wave precision rectifier using op-amps also plot its V-I characteristic.
 - 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.
 - Explain with suitable diagram of Butterworth and Chebyshev magnitude response.
 - Define with suitable diagram of Gorski-Popiel's Embedding Technique, Bruton's FDNR technique.
 - What do mean by Bode sensitivity and Delay equalization? Explain with an example.

SECTION-C

- Attempt any two of the following: (15×2=30)**
- 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.
 - 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.
 - Write short note of the following with suitable diagram:
 - First-order and Second-order filter Realization
 - Strategies for Equalization Design