



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

PAPER ID : 131651

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15
ANALOG SIGNAL PROCESSING

Time : 2 Hours]

[Total Marks : 50

Note : All questions are compulsory:

1 Attempt any two parts: **6x2=12**

- (a) Draw the circuit for addition of voltage signals using
- (i) transconductance amplifier
 - (ii) instrumentation amplifier
 - (iii) second generation current conveyor.
- (b) Describe the operation of integrator circuit in detail. Discuss the role of feedback and balancing resistors.
- (c) Describe the operation of temperature compensated exponential amplifier.

2 Attempt any two parts: **6x2=12**

- (a) Describe in detail the operation of peak detector.
How it can be converted into valley detector?
- (b) Discuss the superiority of precision rectifier over conventional rectifier. Describe the operation of precision full wave rectifier.
- (c) Discuss the opamp based impedance convertor circuits for realizing
 - (i) lossless inductor and
 - (ii) lossy inductor.

3 Attempt any two parts : **6x2=12**

- (a) Perform addition, multiplication, squaring and square rooting functions using MPY 100. Also, realize the circuit for square rooting using multiplier and opamp.
- (b) Describe the simulation of grounded inductor using trans-conductance amplifier based Gyrator. Investigate the effect of circuit non-idealities. Draw its differential version.

- (c) Draw the Gm-C equivalent of RLC circuit shown in Fig. 1 using (i) Element replacement and (ii) operational simulation method.

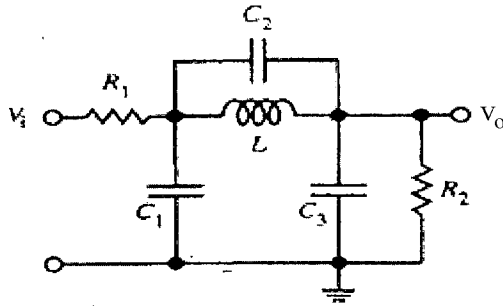


Fig. 1

- 4 Attempt any two parts: **7x2=14**
- (a) Derive the transfer function of low pass Sallen-key filter. Comment over its Q-sensitivity.
- (b) Analyze the deviation in various parameters of band pass response of KHN biquad in presence of lossy integrators. What is pre-distortion?
- (c) Discuss the inverting and non-inverting integrators with equal but negative and positive loss terms respectively. Also, describe their role in the realization of Ackerberg Moserberg filter.