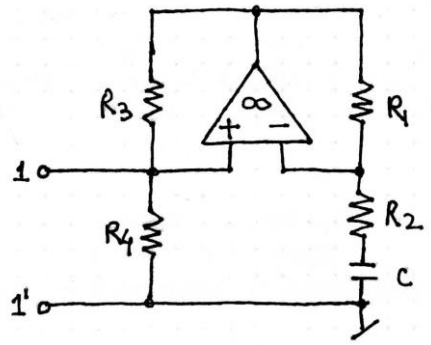
Paper Code: EC-023	**Roll No.**									

B.Tech.
(SEM VI) EVEN SEMESTER EXAMINATION, 2015-16
ANALOG SIGNAL PROCESSING

[Time: 2 hrs.] **[Max. Marks: 50]**

Note- Attempt any five questions. All questions carry equal marks.

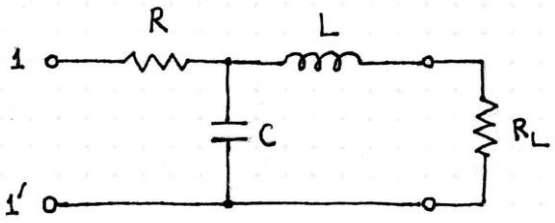
1. (a) Derive the input impedance of the following circuit.



(b) Derive the expression of an instrumentation amplifier using three op-amps and compare this with other differential amplifiers. The circuits drawn should be neat and legible.

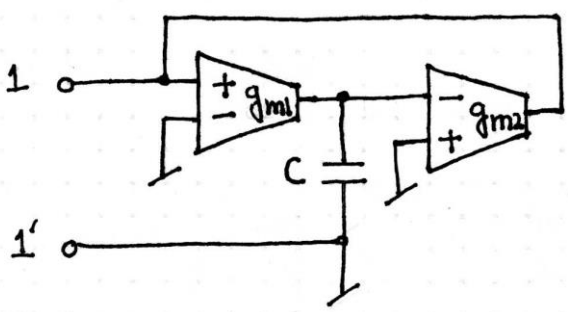
2. (a) Define Generalized Impedance Convertor. Draw its circuit using op-amps. Derive its expression for an inductance simulation.

(b) Derive the transfer function of following ladder filter. Convert this filter in to an active filter using Gyrator.

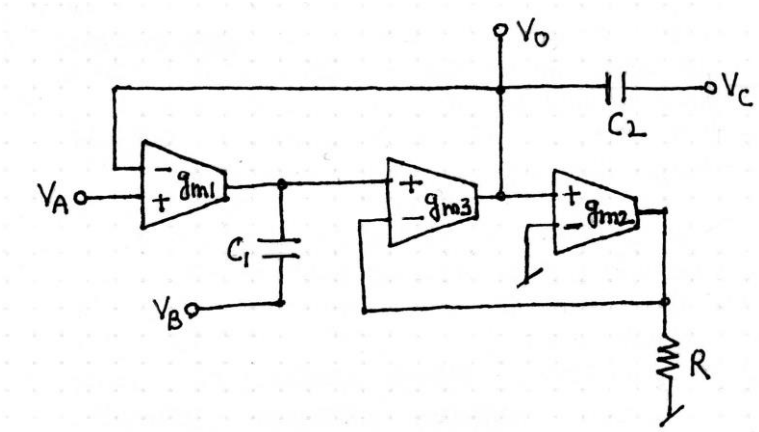


3. (a) Derive the expression for (i) all OTA amplifier and (ii) Floating VVR.

(b) Derive the input impedance of the following circuit.



4. Derive the transfer function of the following filter circuit. Find the values of Q_0 and ω_0.



5. (a) What are the major differences between first generation and second generation current conveyor? Draw the circuit diagram of integrator, differentiator and voltage summer using CCII+.
   (b) Draw the circuit of a floating NIC using CCI and derive its expression.

6. (a) Draw the circuit of a grounded inductance using CCII. Derive its value.
   (b) Draw the circuit of FDNR using CCs. What are the applications of an active Gyrator?

7. Attempt any two of the following
   (a) Write the history of origin of Current conveyors.
   (b) Prove that OTA is better device than Op-amp.
   (c) LT Bruton's method of transformation of passive filter to active filter with suitable example.