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

PAPER ID : 2481 Roll No.

B.Tech.

(SEM. VI) THEORY EXAMINATION 2011-12

ANALOG SIGNAL PROCESSING

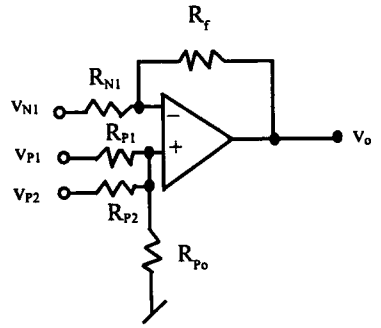
Time : 2 Hours *Total Marks : 50*

Note :— (1) Attempt all **four** questions.

(2) All questions carry equal marks.

1. Attempt any **two** parts of the following :— **(6×2=12)**

(a) Design a circuit to obtain $v_0 = -2v_{N1} + v_{p1} + 2v_{p2}$ in the following configuration. The smallest resistor used should be 10 kΩ.



(b) Draw the circuit of a non-inverting integrator circuit and find its transfer function.

(c) Draw the circuit of an inverting-negative half wave rectifier and its transfer characteristics. Explain its working.

2. Attempt any **two** parts of the following :— **(6×2=12)**

(a) What is a negative impedance convertor ? Draw its circuit diagram and find the input impedance.

(b) Draw the circuit of a capacitance multiplier and find the equivalent circuit of the impedance you obtain.

(c) Draw the circuit of a Logarithmic amplifier and use it for the multiplication of two signals. Draw the resulting circuit diagram and find the transfer function.

3. Attempt any **two** parts of the following : **(7×2=14)**

(a) Draw the block diagram of Tow Thomas biquad. Derive the circuit diagram of the biquad. Find the transfer function of high pass, low pass functions.

(b) 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.

(c) Draw the circuit of a generalized impedance convertor (GIC). Realize a grounded inductance using GIC and find its value.

4. Attempt any **two** parts of the following :— **(6×2=12)**

Write short notes on any **two** of the following :—

(a) Analog dividers

(b) Sallen-key circuits

(c) Transconductance cells.