No. of Printed Pages : 4

BIEEE-012

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

00507

June, 2014

BIEEE-012 : ACTIVE FILTER DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *Attempt any **seven** questions. All questions carry equal marks. Use of calculator is permitted. Missing data may be suitably assumed.*

1. Give the second order s-domain equation for all five types of filter. Also give their pole-zero plot. *10*

2. Realize the following specification with a maximally flat magnitude response : *10*

α_{max} = 0·5 dB, α_{min} = 20 dB

ω_p = 1000 rad/sec, ω_s= 2000 rad/s.

3. For the circuit shown in figure 1, find the transfer function $V_o(s) / V_i(s)$. Identify the response and determine filter parameters. Assume ideal op-amp. *10*

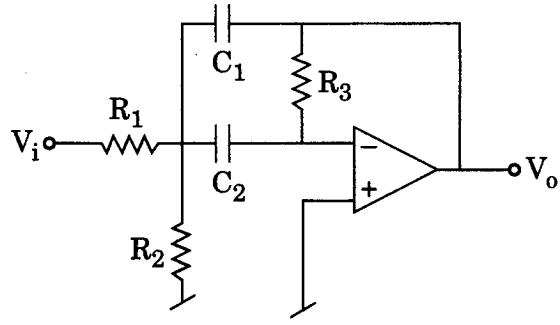

Figure 1

4. Design a Sallen-Key low pass filter with following specifications : *10*

$f_c = 4{\cdot}8$ kHz, Q = 5 and dc gain H = 3.

5. Give the circuit diagram of a KHN filter, obtain the transfer function and identify filter parameters. *10*

6. Draw the circuit diagram of a Generalized Impedance Converter (GIC) as given by Antoniou and show how a grounded inductor can be simulated using the above circuit. *10*

7. Determine the input impedance (Z_{in}) for the circuit shown in figure 2. Also draw the passive equivalent of the circuit. *10*

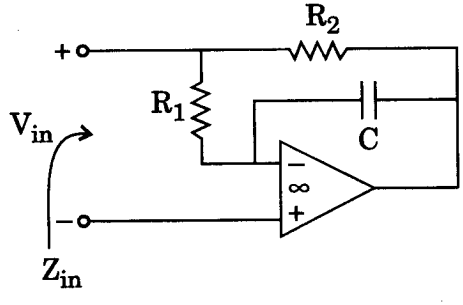

Figure 2

8. Determine the transfer function V_2 / V_1 for the circuit shown in figure 3 considering non-ideal op-amp with A = ωt/s. Identify the nature of filter response and determine the filter parameters. *10*

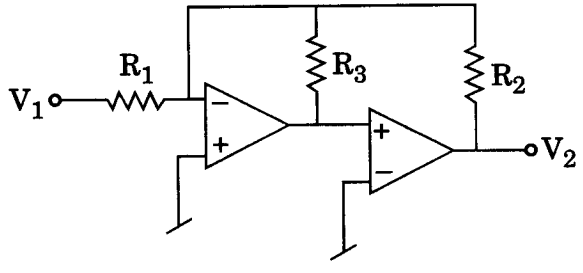

Figure 3

9. Explain the procedure for obtaining higher-order filter (e.g. a fifth order) by cascading of lower-order filters. *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(i) Butterworth Approximation

(ii) Phase-error compensation

(iii) Delay-Equalizer functions
