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BIEEE-012

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

Term-End Examination

00545

June, 2019

BIEEE-012 : ACTIVE FILTER DESIGN

Time : 3 hours *Maximum Marks : 70*

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

1. (a) Write down the advantages and disadvantages of active filters as compared to passive filters. *5*

(b) Describe the function of delay equalizer by taking appropriate example. *5*

2. Draw and explain the frequency response curve and pole-zero diagram for second order Low Pass (LP), High Pass (HP), Band Pass (BP) and All Pass filters with its transfer function. *10*

3. (a) Design the op-amp-RC circuit of Figure 1 to realize an All Pass filter with a 90° phase shift at 10^3 rad/sec. Select suitable component values. *5*

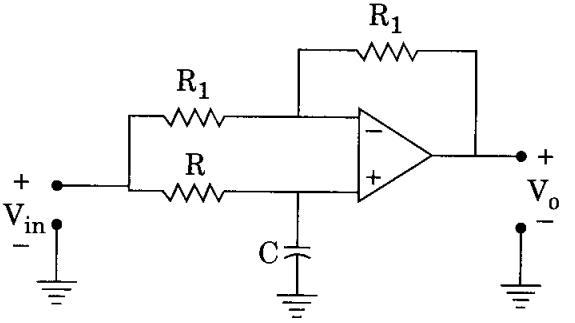

Figure 1

(b) Define Sensitivity. Why is sensitivity important in the designing of filters ? *5*

4. Realize a GIC (Generalized Impedance Converter) Band Pass filter with f_0 = 50 kHz, Q = 9 and H = 3. *10*

5. Draw the circuit diagram of a KHN (Univeral Active Filter) Biquad filter and derive its transfer function to prove that it realizes a Low Pass, a Band Pass and a High Pass filter. *10*

6. Realize Low Pass and High Pass filter using Antoniou Gyrator. *10*

7. Discuss the various elementary ideas of compensation in multiple op-amp filters with the help of necessary diagrams. *10*

8. Write down the advantages and disadvantages of active RC filters over Switched Capacitor (SC) filters. Design a second order Low Pass Butterworth filter with gain = 10 and f_1 = 1 kHz. *4+6*

9. Describe the various steps in the synthesis of LC ladder networks using gyrators. *10*

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

(a) Frequency-Dependent-Negative Resistors (FDNR)

(b) Tow-Thomas Biquad Filter

(c) Elliptic Approximation