No. of Printed Pages : 2

BIEEE-012

B.Tech. In ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2013

BIEEE-012 : ACTIVE FILTER DESIGN

Time : 3 hours *Maximum Marks : 70*

*Note : (i) Attempt **any seven** questions.*

*(ii) All question carry **equal** marks.*

*(iii) Use of **scientific** calculator is **allowed**.*

1. Define the following terms : 5x2=10
   (a) Pass band
   (b) Transition band
   (c) Stop band
   (d) Attenuation
   (e) Cutoff frequency

2. With the help of circuit diagram, explain the operation of second order band pass filter. Also derive the expression for the gain. 10

3. For a second order LPF, calculate the cut-off frequency and pass band voltage gain, if the components values are $R_1 = 12\ K\Omega$, $R_F = 7\ K\Omega$, $R_1 = R_2 = 33\ K\Omega$, $C_1 = C_2 = 0.002\mu F$. 10

4. Write down the steps for designing a single op-amp Biquad filter with finite gain. 10

5. Write a short note on the following : **2x5=10**
   (a) Tow - Thomas biquad filter.
   (b) Elementary ideas of compensation.

6. Derive the expression for the filter gain of second order high pass filter and also draw its frequency response curve. **10**

7. (a) Draw various types of bridge - T RC circuits, which are generally used in active filters. **5**
   (b) How KHN Biquad filter can be used as low and high pass filter ? **5**

8. (a) Draw the symbol of gyrator. How gyrators can be used for impedance scaling ? **5**
   (b) With the help of circuit diagram, explain the operation of low pass filters using Antoniou Gyrators. **5**

9. (a) How inductance simulation is done by Frequency dependent negative resistors ? **5**
   (b) Write down the advantages of Frequency dependent negative resistors (FDNR) technique of inductor simulation as compare to other techniques. **5**

10. (a) Draw and explain the operation of Band pass switched - capacitor filters. Give its applications. **5**
    (b) Give a circuit realization of any type of LC ladder network using gyrator. **5**