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Reg. No. : ....

Name : ....

VII Semester B.Tech. Examination, July 2009
S7 : Applied Electro and Instrumentation
BIOMEDICAL AND SIGNAL PROCESSING LAB (A)

Time : 3 Hours

Marks : 100

1. Write a Matlab program for simulation of a Digital I.I.R. Butterworth lpf using bilinear transformation for following specification in analog domain.

    Passband frequency, fp = 2 Khz

    Attenuation at fp = 3 dB

    Stopband frequency, fs = 5 Khz

    Attenuation at fs = 65 dB

    Sampling frequency = 48 Khz

    Find the transfer function H(s), H(z) and plot the Magnitude and Phase response of the filter.

2. Write a Matlab program for simulation of a Digital F.I.R. for following specification in analog domain.

    Cut-off frequency, fp = 2 Khz

    Passband ripple = 0.02

    Stopband frequency, fs = 4 Khz

    Stopband ripple = 0.02

    Sampling frequency = 240 Khz

    Window = Kieser Window

    Find the order of the filter and plot the Magnitude and Phase response of the filter.

3. Using DSP board write a program for generating 2 KHz Sine wave.

4. Using DSP board write a program for implementing a FIR low pass filter for Cut-off frequency 1 Khz. Sampling frequency 16 Khz.

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5. Using DSP board write a program for implementing a IIR second order Butterworth low pass filter for Cut-off frequency 2 Khz. Sampling frequency 16 Khz.

6. Write a Matlab program for simulation of a Digital I.I.R Butterworth hpf using bilinear transformation for following specification in analog domain.

   Passband frequency, fp = 5 Khz

   Attenuation at fp = 2 dB

   Stopband frequency, fs = 2 Khz

   Attenuation at fs = 60 dB

   Sampling frequency = 48 Khz

   Find the transfer function H(s), H(z) and plot the Magnitude and Phase response of the filter.

7. Write a Matlab program for simulation of a Digital I.I.R. Chebyshev lpf using bilinear transformation for following specification in analog domain.

   Passband frequency, fp = 1 Khz

   Attenuation at fp = 2 dB

   Stopband frequency, fs = 5 Khz

   Attenuation at fs = 60 dB

   Sampling frequency = 48 Khz

   Pass band ripple in dB = 0.5

   Find the transfer function H(s), H(z) and plot the Magnitude and Phase response of the filter.

8. Using DSP board write a program for implementing a FIR high pass filter for Cut-off frequency 2 Khz. Sampling frequency 16 Khz.

9. Using DSP board write a program for implementing a IIR second order Chebyshev high pass filter for Cut-off frequency 1 Khz. Sampling frequency 16 Khz.

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10. Write a Matlab program for simulation of a Digital FIR band pass filter of length 41 for meeting following specification in analog domain.

   Order of the filter N = 41

   Sampling frequency = 48 Khz

   Lower cut-off frequency = 1 Khz

   Upper cut-off frequency = 2 Khz

   Use rectangular window.

   Plot impulse response h(n) and magnitude and phase response of the filter.

11. Write a Matlab program for simulation of a Digital FIR band stop filter of length 41 for meeting following specification in analog domain.

   Order of the filter N = 41

   Sampling frequency = 48 Khz

   Lower cut-off frequency = 1 Khz

   Upper cut-off frequency = 2 Khz

   Use rectangular window.

   Plot impulse response h(n) and magnitude and phase response of the filter.

12. Setup a Bio Potential Amplifier.

13. Setup a circuit for respiratory rate measurement.

14. Setup and plot ECG waveforms.

15. Using Cardimate, measure ECG parameters.

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