Department of ECE

Assignment –III

PART-A

1. What is frequency warping in bilinear transformation?
2. Define prewarping
3. Why direct Fourier series method is not used in FIR filter design?
4. Comparison of analog and digital filters.
5. Compare Butterworth filter and chebyshev filter
6. Compare Bilinear Transformation and Impulse Invariant Transformation
7. Write the transformation equation to convert low pass filter into band stop filter.
8. Define bilinear transformation with expressions

PART-B

1. a) Given an analog transfer function as
   $H(S) = 1 / (S+1)(S+2)$. Obtain H (z) using impulse invariant method. Take T =1 sec
   b)For given analog filter system function
   $H(S) = S+0.1 / (S+0.1)^2 + 16$ into digital IIR filter by means of bilinear transformation.
   Digital filter is to have resonant frequency $\omega_r = \frac{\pi}{2}$

2. An IIR low pass filter is to be designed to meet the following specifications.
   (a) Pass-band frequency = 0 to 1.2 kHz
   (b) Stop-band edge = 2KHz
   (c)Pass-band attenuation $\leq$ 8.5db
   (d) Stop-band attenuation $\geq$ 15 db
   Using Butterworth approximation and bilinear transformation obtain the desired IIR digital Filter.
3. Obtain the direct form I, direct form II, cascade form realization of the system
   $y(n)=-0.1y(n-1)+0.2y(n-2)+3x(n)+3.6x(n-1)+0.6x(n-2)$

4. Design a chebyshev filter for the following specification using BLT
   $0.707 \leq |H(e^{j\omega})| \leq 1 \quad 0 \leq \omega \leq 0.2\pi$
   $|H(e^{j\omega})| \leq 0.1 \quad 0.5\pi \leq \omega \leq \pi$