Tutorial Sheet No.–11

question no. 01:– Determine the transfer function of a Butterworth filter of the lowpass-type with order $N = 3$. Assume that the -3dB cut-off frequency is 1 rad/sec (i.e., $\Omega_c = 1$).

question no. 02:– Consider a type-I Chebyshev lowpass filter whose system function is

$$H_{lp}[z] = \frac{0.001836\,(1+z^{-1})^4}{(1-1.5548z^{-1}+0.6493z^{-2})(1-1.4996z^{-1}+0.8482z^{-2})}$$

with passband cutoff frequency $\Omega_p = 0.2\pi$. Convert it to a highpass filter with passband cutoff frequency $\omega_p = 0.6\pi$.

{Use transformation from a lowpass-filter to a high-pass filter in the digital domain.}

question no. 03:– Determine the transfer function of a Butterworth filter of the lowpass-type with gain -2 dB at angular frequency 20 rad/sec. This analog filter design specification includes 10 dB attenuation at 30 rad/sec. Find out N, Ω_c and $H_a(s)$.