Fourier Analysis of Systems

1. A linear time-invariant continuous-time system has the frequency response function H(ω)=5cos(2ω), compute the system's impulse response h(t):
2. A signal with the highest frequency component at 10 kHz is to be sampled. To reconstruct the signal, the sampling must be done at a minimum frequency of:
3. An ideal low-pass digital filter has the frequency function H(πΩ) as shown in the figure. Determine the unit-pulse response h[n] of the filter. Note: The discontinuities occur at -π/4 and +π/4.

