

1, a)  $\omega_0 = 100 \text{ r/s}$

b)  $c_0 = 1$ ,  $c_3 = c_{-3}^* = e^{j\frac{\pi}{4}}$ ,  $c_5 = c_{-5}^* = -\frac{j}{2}$   
 övriga  $c_k = 0$

c)  $\sum_{k=-\infty}^{\infty} |c_k|^2 = \dots = 3.5$

2, a)  $H(z) = 3(z-1)/(z+0.9)$

b) Nollställe:  $z=1$  Pol:  $z=-0.9$

c)  $h[n] = 3\delta[n] - 1.9(-0.9)^{n-1}u[n-1]$  eller

$h[n] = 3(-0.9)^n u[n] - 3(-0.9)^{n-1} u[n-1]$

$h[n] = [0, 3, -5.70, 5.13, -4.62, 4.16, \dots]$

3/  $H(s) = \frac{Z(s+3)}{(s+1)(s+6)}$  ;  $h(t) = \frac{1}{5}(4e^{-t} + 6e^{-6t})u(t)$

4/ a) 16 b)  $\omega_0 = \frac{125\pi}{8} \text{ r/s}$  c)  $\Omega_{b0} = \frac{\pi}{32} \text{ rad}$

d)  $k=16$  e)  $k=16$  svarat mot  $\omega_0$ .

5/ Studera de tre delarna i  $x(t)$  var för sig. Superposition ger

$$y(t) = 2 + 2.008 \cos(100t - 0.05) + \delta(t-1) + \delta(t-1) + 5e^{-5(t-1)}u(t-1)$$

rad