10.5 $Z_0 = 50\,\Omega$ $\gamma = 0 + j0.2\pi\ m^{-1}$ $f = 60$ MHz

$\beta = 0.2\pi = \omega\sqrt{LC}$ $Z_0 = \sqrt{\frac{L}{C}}$

a) $\beta / Z_0 \omega = C = 33.3\ pF/m$

$L = C Z_0^2 = 83.3\ nH/m$

$Z_L = 60 + j80\ \Omega$ $z = 0$

$\Gamma = \frac{60 + j80 - 50}{60 + j80 + 50} = 0.405 + j0.432 = 0.592 \angle 0.818$

$z_{max} = \frac{\phi}{2\beta} = 0.65\ m$

10.13 $Z_0 = 50\,\Omega$ $v_p = 2E^8$ m/s $V^+(z,t) = 200\cos(\omega t - \pi z)$ V

a) $\beta = \pi$ $\omega = \beta v_p = 6.28_E{}^8$ rad/s

b) $I^+(z,t) = \frac{V^+(z,t)}{Z_0} = 4\cos(\omega t - \pi z)$ A

$Z_L = 50 + j30\ \Omega$ $z = 0$

c) $\Gamma_L = \frac{50 + j30 - 50}{50 + j30 + 50} = 0.0825 + j0.275$

d) $V_s^-(z) = \Gamma_L V_s^+(z) e^{j2\beta z} = 57.5 e^{j(\pi z + 1.28)}$

e) $V_s(-2.2) = V_s^+(-2.2) + V_s^-(-2.2) = 257.5 e^{j0.63}$

10.16 $Z_0 = 100\,\Omega$ $Z_1 = 40\,\Omega$ $\ell = \lambda/4$ $Z_2 = 25\,\Omega$

$P = 80$ W

10.26 $Z_0 = 50\,\Omega$ $\ell = 1.1\lambda$ $Z_L = 75\,\Omega$ VSWR = 4

$d = 0.2\lambda$

$0.25 + j0.31 \rightarrow 18.8 + j23.3$

11.2 $f = 10$ GHz $\epsilon_r = 8$ $\mu_r = 2$

$v_p = c/\sqrt{\epsilon_r} = 106E^6$ m/s

$\beta = \omega/v_p = 592\ m^{-1}$

$\lambda = 2\pi/\beta = 0.0106$ m

$\vec{E}_s = E_0 e^{-j\beta z} a_x = E_0 e^{-j592z} a_x$

$\vec{H}_s = E_0/\eta\, e^{j\beta z} a_y =$ $\eta = \eta_0/\sqrt{\epsilon_r}$