REŠENJA

1. a)

$$\underline{Z} = \underline{V} / \underline{I} = \frac{1-j}{1+j} = \frac{(1-j)^2}{1-j^2} = \frac{1-2j+j^2}{2} = -j$$

R=0, X=–1, G=0, B=1, $S = VI = \sqrt{2} \cdot \sqrt{2} = 2VA$

b)

$$P = RI^2 \quad Q = XI^2 \quad S = \sqrt{P^2 + Q^2} \quad V = \frac{S}{I} = ZI$$

c) Ukupna admitansa i susceptansa potrosaca iznose

$$\underline{Y_P} = j\omega C_p - j\omega \frac{L_p}{R_p^{\,2} + \omega^2 L_p^{\,2}} + \frac{R_p}{R_p^{\,2} + \omega^2 L_p^{\,2}}$$

$$\underline{B_p} = \omega \left(C_p - \frac{L_p}{R_p^{\,2} + \omega^2 L_p^{\,2}} \right)$$

Da bi se ostvarila kompenzacija reaktivne snage susceptansa treba da bude jednaka nuli
Razlikuju se 3 slucaja:

I) $\underline{B_p} = 0$ nema potrebe za kompenzacijom

II) $\underline{B_p} < 0, C_p$ je malo, treba da se doda paralelno $C = -\left(C_p - \frac{L_p}{R_p^{\,2} + \omega^2 L_p^{\,2}} \right)$

$\underline{B_p} > 0$ C_p je preveliko, treba da se doda paralelno L takoda je ispunjeno

III) $\frac{1}{\omega L} - \omega \left(C_p - \frac{L_p}{R_p^{\,2} + \omega^2 L_p^{\,2}} \right) = 0$

2.

a) $V_I = \frac{(1+\beta_F)R_E}{R_B + (1+\beta_F)R_E}(V_{CC} - V_Z - V_{BE}) \approx \frac{6.2\text{V}}{2} = 3.1\text{V}$

b) $V_{CC\min} = V_\gamma + V_Z = 3.8\text{V}$

3.

a) $a = 5, \rho \to \infty$

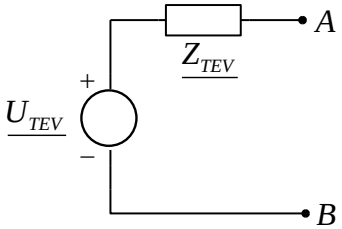
b)

$$v_I = \left(\frac{5.5R}{6.5R} \right) \left(1 + \frac{5R}{R} \right) v_2 - \frac{5R}{R} v_1 = 5.08 v_2 - 5 v_1 = a_1 v_1 + a_2 v_2$$

$$a_s = 0.08, a_d = 5.04, \rho = 67.5$$

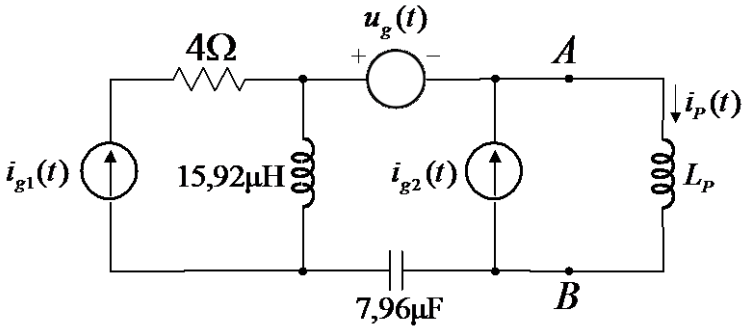
4. a) $\underline{Z_{TEV}} = j\Omega$

$\underline{U_{TEV}} = -2(1+j)\text{V}$



b) $\underline{S} = 0 + j2\,;\ P = 0\,;\ Q = 2\text{VAr}\,.$

c) $\underline{I_P} = -1 + j\,;$ $\qquad i_P(t) = 2\text{A}\cos(2\pi ft + 135°)$



5. $v_o = \frac{1}{3}v_1 + \frac{1}{2}v_2$