is larger ~~than~~ than the complex power value obtained in 6.1c by 1.1 var as the transmission line also consumes real and reactive power.

d The ratings of some electrical apparatus are represented in VA instead of watts because they may not be purely resistive and will consume reactive power in addition to real power consumed. Such apparatus are computers and other electronics. It is also possible to calculate the real and reactive power consumed by the apparent power rating given in VA of the electrical apparatus.

e From 6.1c,

$P = 15.1\ W$

$Q = 10.7\ var$

$Q_{old} = Q_{new} = 0$

~~theoretically~~

$10.7 - Q_c = 0$

$Q_c = 10.7\ var$

$Q_c = IV$

$j10.7 = I_c(19.22)$

$I_c = j0.5567\ A$

$Z_c = \frac{19.22}{-j0.5567}$

$-j\frac{1}{\omega C} = -j34.524$

$\frac{1}{2\pi(50)C} = 34.524$

$C = 92.2\mu F$

f $Z_c = -j\frac{1}{\omega C}$

$= -j\frac{1}{2\pi(50)(30\times10^{-6})}$

$= -j106.10$

$Z_{total} = \left(\frac{1}{16+j(89.1\times10^{-3})(2\pi(50))} + \frac{1}{33+j(2\pi(50))(26\times10^{-3})} + \frac{1}{-j\frac{1}{(2\pi(50))(30\times10^{-6})}}\right)^{-1}$

$= \left(\frac{1}{32.24\angle 60.25^\circ} + \frac{1}{34.00\angle 13.90^\circ} + 0.009425\angle 90^\circ\right)^{-1}$

$= (+j0.02457 + 0.04394)^{-1}$

$= 19.86\angle -29.213^\circ$

$I = \frac{V}{Z}$