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1). Diketahui

$$V_{s(CLL)} = 300$$

$$V_m = 300 \times \sqrt{2}$$

$$= 424,26$$

$$f = 50 \text{ Hz}$$

$$R = 20 \Omega$$

$$\begin{aligned} a). V_{o(AC)} &= 0,955 \times V_m \\ &= 0,955 \times 424,26 \\ &= 405,21 \text{ V} \end{aligned}$$

$$\begin{aligned} V_{o(rms)} &= 0,955 \times V_m \\ &= 287,62 \text{ V} \end{aligned}$$

$$\begin{aligned} V_{ac} &= \sqrt{(V_{o(rms)})^2 - (V_{o(DC)})^2} \\ &= \sqrt{(287,62)^2 - (513,21)^2} \\ &= 20,392 \text{ V} \end{aligned}$$

$$A_{V_o} = \frac{V_{ac}}{V_{s(CLL)}} = \frac{20,392}{300} = 0,06797$$

$$b) F_F = \frac{V_{o(rms)}}{V_{o(DC)}} = \frac{287,62}{405,21} = 0,7098$$

$$\begin{aligned} c). \theta_f &= \sqrt{F_F^2 - 1} \\ &= \sqrt{(0,7098)^2 - 1} \\ &= 0,7103 \end{aligned}$$

$$\begin{aligned} d). P_{o(AC)} &= V_{o(AC)} \times I_{o(AC)} \\ &= V_{o(AC)} \times \frac{V_{o(AC)}}{R} \\ &= 513,21 \times \frac{513,21}{20} \\ &= 13169,5800 \text{ Watt} \end{aligned}$$

$$\begin{aligned} P_{o(DC)} &= V_{o(DC)} \times I_{o(DC)} \\ &= 513,62 \times \frac{513,62}{20} \\ &= 13190,27 \text{ Watt} \end{aligned}$$

$$\eta = \frac{P_{o(DC)}}{P_{o(AC)}} = 99,89\%$$

$$E). P = \sqrt{3} \times V_{s(CLL)} \times I_{s(rms)}$$

$$I_{s(rms)} = 0,7098 \times I_m$$

$$= 0,7098 \times 26,087$$

$$= 18,51 \text{ A}$$

$$P = \sqrt{3} \times V_{s(CLL)} \times I_{s(rms)}$$

$$= \sqrt{3} \times 300 \times 18,51$$

$$= 9501,36 \text{ W}$$

f) Reaktansi  $X_L = \omega L$

Karena hanya menggunakan beban reaktif tanpa beban induktif

$$g). V_{s(CLL)} = 300$$

$$I_{m(A)} = \frac{V_m(CLL)}{R} = 26,087 \text{ A}$$

$$I_{s(rms)} = 0,7098 \times I_m$$

$$= 0,7098 \times 26,087$$

$$= 18,51$$

$$P = \sqrt{3} \times V_{s(CLL)} \times I_{s(rms)}$$

$$= \sqrt{3} \times 300 \times 18,51$$

$$= 9501,36 \text{ VA}$$

$$h). P_{o(DC)} = 13190,27 \text{ W}$$

$$> = 13801,36 \text{ VA}$$

$$\begin{aligned} P_k &= \frac{P_{o(DC)}}{P_{o(AC)}} = \frac{13190,27}{9501,36} \\ &= 1,388 \end{aligned}$$

2.). Diketahui

$$V_p(L-L) = 300 \text{ V}_{rms}$$

$$R = 100 \Omega$$

$$f = 80 \text{ Hz}$$

$$N_1 : N_2 = 3 : 1$$

$$a). \frac{N_1}{N_2} = \frac{V_1(rms)}{V_2(rms)}$$

$$\frac{3}{1} = \frac{300}{V_2(rms)}$$

$$V_2(rms) = 126,66 \text{ V}$$

$$V_2(max) = 126,66 \sqrt{2} \\ = 179,12 \text{ V.}$$

$$I_0(dc) = \frac{V_0(dc)}{R} \\ = \frac{171,05}{100} = 1,71 \text{ A.}$$

$$V_0(dc) = 0,955 \times V_2(max) \\ = 0,955 \times 179,12 \\ = 171,05 \text{ V}$$

$$b). V_2(max) = 179,12 \text{ V.}$$

$$V_0(rms) = 0,955 \times V_2(max) \\ = 0,955 \times 179,12 \\ = 171,19 \text{ V.}$$

$$I_0(rms) = \frac{V_0(rms)}{R} \\ = \frac{171,19}{100} = 1,71 \text{ A}$$

$$c). V_2(max) (L-L) = 179,12$$

$$I_m = \frac{V_2(max) (L-L)}{R} \\ = \frac{179,12}{100} = 1,791 \text{ A}$$

$$I_2(rms) = 0,709 \times I_m \\ = 0,709 \times 1,791 \\ = 1,271 \text{ A.}$$

$$d). V_0(rms) = 171,19 \text{ V}$$

$$I_0(rms) = 1,71 \text{ A.}$$

$$V_2(rms) = 126,66 \text{ V}$$

$$I_2(rms) = 1,271 \text{ A.}$$

$$P_{dc} = V_0(rms) \times I_0(rms)$$

$$= 171,19 \times 1,71$$

$$= 293,05$$

$$S = \sqrt{3} \times V_2(rms) \times I_2(rms)$$

$$= \sqrt{3} \times 126,66 \times 1,271$$

$$= 306,97 \text{ VA.}$$

$$PF = \frac{P_{dc}}{S} = \frac{293,05}{306,97} = 0,95$$

$$E) = FF = \frac{V_0(rms)}{V_0(dc)} \\ = \frac{171,19}{171,05} = 1,0008$$

$$F). P_c = \sqrt{FF^2 - 1} \\ = \sqrt{(1,0008)^2 - 1} \\ = 0,04$$

$$g) P_0(dc) = V_0(dc) \cdot I_0(dc)$$

$$= 171,05 \cdot 1,71$$

$$= 292,58 \text{ W}$$

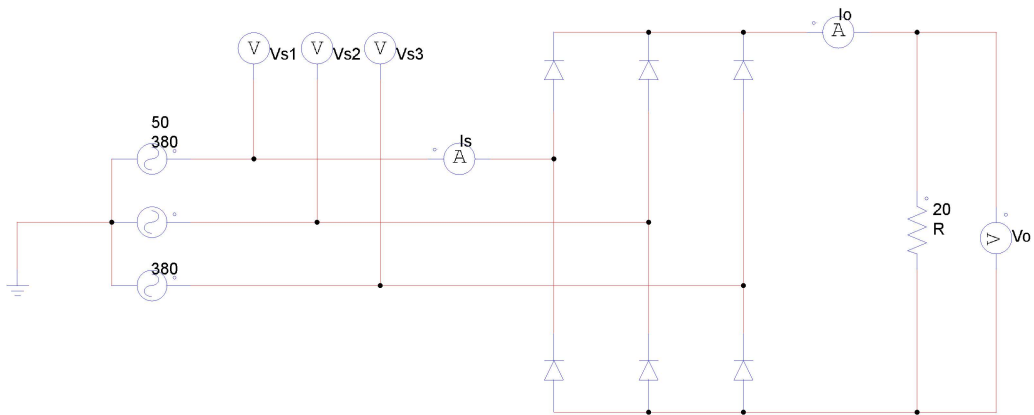
$$P_0(ac) = V_0(rms) \cdot I_0(rms)$$

$$= 171,19 \times 1,71$$

$$= 293,06 \text{ W}$$

$$\eta = \frac{P_0(dc)}{P_0(ac)} \times 100$$

$$= 99,83\%$$



GAMBAR RANGKAIAN