

NAME:	STUDENT NO:		MARKS
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SUBJECT:	ASSIGNMENT NO:		TUTORIAL COMMENTS
	SUBJECT CODE:		

a) $V_r = 18 \text{ kV}$ $p.f. = 0,8$
 $R_s = 4 \Omega$ $X_L = 7 \Omega$

$\therefore P.f. = \frac{\text{True Power}}{\text{Apparent Power}}$

True Power = $3300 \times 0,8$
 $= 2460 \text{ kW}$

For Current: $P = \sqrt{3} V_L I_L \cos \phi$ $(\cos \phi = 0,8)$

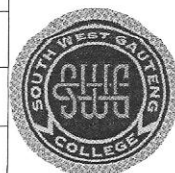
$I_L = I_r = \frac{2640 \times 10^3}{\sqrt{3} \cdot 18 \times 10^3 \cdot 0,8}$
 $= 105,85 \text{ A}$

For voltage: $V_{r/\text{phase}} = \frac{V_{r/L}}{\sqrt{3}} = \frac{18 \times 10^3}{\sqrt{3}}$
 $= 10392,305 \text{ V}$

For $V_{s/\text{phase}}$: $V_{s_{/ph}} = V_{r/ph} (I R \cos \phi + I X_L \sin \phi)$ $\left. \begin{array}{l} \cos^{-1}(0,8) = \phi \\ \sin \phi = 0,6 \end{array} \right\}$

$= 10392,305 (105,85 \cdot 4 \cdot 0,8 + 105,85 \cdot 7 \cdot 0,6)$
 $= 11175,6 \text{ V}$

$\therefore V_{s/L} = \sqrt{3} \times V_{s/\text{phase}} = \sqrt{3} \times 11175,6$
 $= 19356,7 \text{ V} \rightarrow$



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b) % Reg. = $\frac{V_{s/L} - V_{r/L}}{V_{r/L}} \times \frac{100}{1}$

= $\frac{19\,356,7 - 18\,000}{18\,000} \times \frac{100}{1}$

= 7,54%

c) Power lossed = $3 \cdot I^2 R$

= $3(105,85)^2 \cdot 4$

= 134 450,67 W

% $\eta = \frac{\text{output}}{\text{input}} \times \frac{100}{1}$

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