

Formulae Sheet for EWRB examinations

For examination use only

$V = IZ$ $I = \frac{V}{Z}$	$X_c = \frac{1}{2\pi fC}$ $X_L = 2\pi fL$	$P = VI \cos\theta$ $P = I^2R$ $P_{\text{delta}} = 3P_{\text{star}}$
<p>Star:</p> $I_L = I_{\text{ph}}$ $V_p = \frac{V_L}{\sqrt{3}}$	$Z^2 = R^2 + (X_L - X_C)^2$ $Z = R \pm jX$	$\text{Pf} = \cos\theta = \frac{P}{S}$ $P = \sqrt{3}V_L I_L \cos\theta$ $P = 3V_{\text{ph}} I_{\text{ph}} \cos\theta$
<p>Delta:</p> $V_L = V_{\text{ph}}$ $I_p = \frac{I_L}{\sqrt{3}}$	$Q = \frac{V^2}{X_c}$ $Q = VI \sin\theta$ $Q_C = P(\tan\phi_1 - \tan\phi_2)$	$S = \sqrt{P^2 + Q^2}$ $S = \sqrt{3}V_L I_L$ $S = VI$
$\%Z = \frac{S_{\text{rating}}}{S_{\text{fault}}} \times 100$	$\% \eta = \frac{nS \cos\phi}{nS \cos\phi + n^2 P_{Cu} + P_{Fe}} \times 100$	$\frac{N_1}{N_2} = \frac{V_1}{V_2} = \frac{I_2}{I_1}$
$P_{\text{ext}} = \frac{2\pi NT}{60}$	$N_s = \frac{60f}{p}$	$\% \text{Slip} = \frac{N_s - N_r}{N_s} \times 100$
$\eta = \frac{P_{\text{out}}}{P_{\text{in}}} \times 100\%$	$\omega = \frac{2\pi N}{60}$	<p>Insulation Resistance</p> $R_2 = \frac{L_1 R_1}{L_2}$
$\text{Tan}\phi = \frac{\text{opp}}{\text{adj}}$	$\text{Sin}\phi = \frac{\text{opp}}{\text{hyp}}$	$\text{Cos}\phi = \frac{\text{adj}}{\text{hyp}}$
<p>Series: $\frac{1}{C_T} = \frac{1}{C_1} + \frac{1}{C_2}$</p> <p>Parallel: $C_T = C_1 + C_2$</p>	$Q = CV$ $R = \frac{\rho l}{A}$	$\% \text{Regulation} = \frac{V_{NL} - V_{FL}}{V_{FL}} \times 100$
$I_{\text{neutral}} = \sqrt{(I_a^2 + I_b^2 + I_c^2) - (I_a I_b) - (I_b I_c) - (I_a I_c)}$ 		