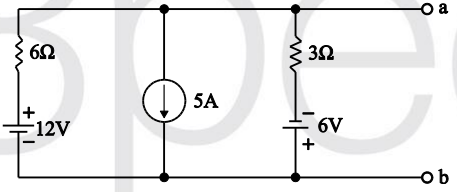
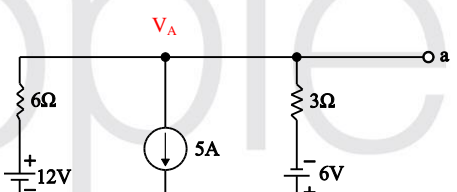


T054E20-1_《基本電學完全攻略》_修訂表

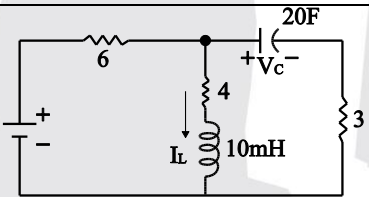
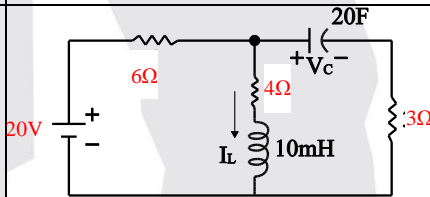
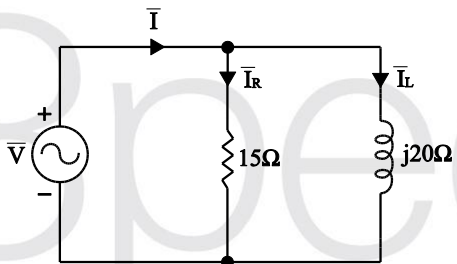
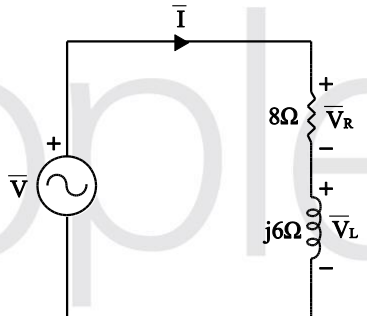
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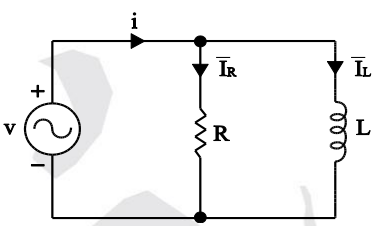
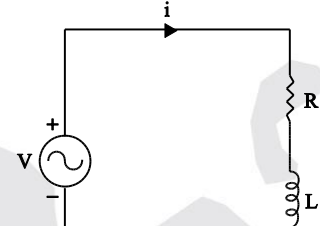
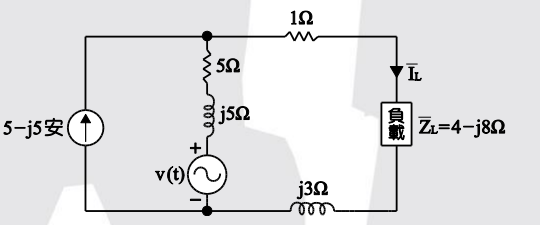
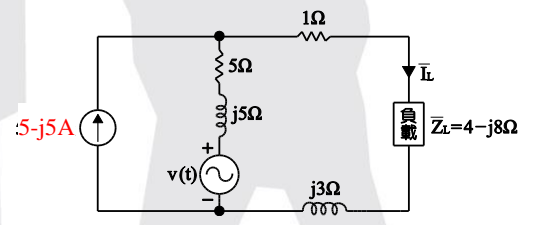
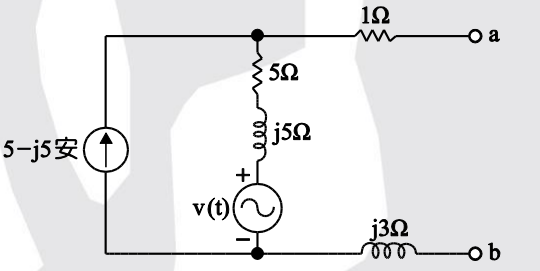
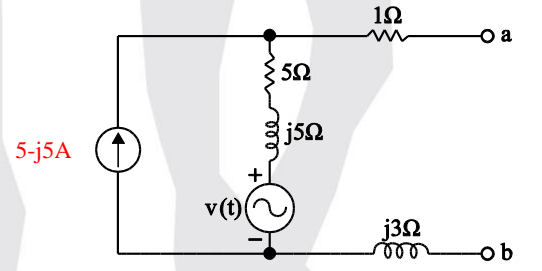
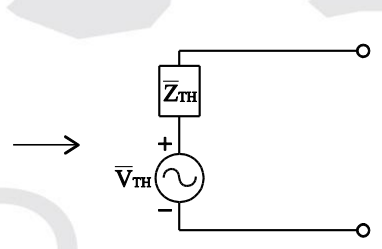
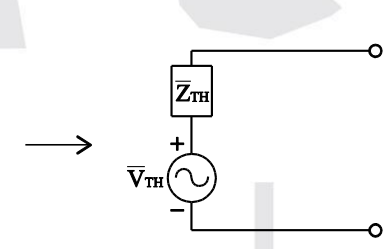
| 頁數 | 修訂處 | 原文 | 修正 | 備註 |
|----|----------------------|---|--|----|
| 13 | 實戰模擬 檢測解析 Q10 | $5 \times 10^{-3} \times t = 4 \times 10^{18} \times 1.62 \times 10^{-19}$ $\Rightarrow t \approx 128.2$ | $5 \times 10^{-3} \times t = 4 \times 10^{18} \times 1.602 \times 10^{-19}$ $\Rightarrow t \approx 128.2$ | |
| | 實戰模擬 檢測解析 Q13 | $\eta_T = \eta_1 \times \eta_2 \times \eta_3 = 0.9 \times 0.9 \times 0.9 = 0.729$ $\cong 0.732$ | $\eta_T = \eta_1 \times \eta_2 \times \eta_3 = 0.9 \times 0.9 \times 0.9 = 0.729$ $\cong 0.73$ | |
| | 實戰模擬 檢測解析 Q15 | $W = P \cdot t = 3000 \times 1 \times 30 = 90 \text{ kW/hr} = 90 \times 2 = 180 \text{ 元}$ | $W = P \cdot t = 3000 \times 1 \times 30 = 90 \text{ kW/hr} \Rightarrow 90 \times 2 = 180 \text{ 元}$ | |
| | 實戰模擬 檢測解析 Q16 | $W = Pt = 100 \times 20 = 2 \text{ (kW/hr)}$ | $W = Pt = 100 \times 20 = 2000 \text{ (W/hr)} = 2 \text{ (kW/hr)}$ | |
| 14 | 二、決定電 阻值大小 的因素 | (三) $R = \rho \frac{l}{A}$ | (三) $R = \rho \frac{l}{A}$ | |
| 24 | 實戰模擬 檢測解析 Q1 | $R_A = \rho \frac{l}{A} = 100 \Omega \cdot R_B = \rho \frac{l}{4A} = 12.5 \Omega$ | $R_A = \rho \frac{l}{A} = 100 \Omega \cdot R_B = \rho \frac{l}{4A} = 12.5 \Omega$ | |
| | 實戰模擬 檢測解析 Q7 | $P_{\text{loss}} = I^2 R = I^2 \times 5 = 5 \text{ W}$ | $P_{\text{loss}} = I^2 R = I^2 \times 5 = 5 \text{ W}$ | |
| | 實戰模擬 檢測解析 Q11 | $5^2 \times 20 \times 50 \times 60 \times 0.24 = 3600 \times 1 \times (T - 20)$ $\Rightarrow T = 30$ | $5^2 \times 20 \times 5 \times 60 \times 0.24 = 3600 \times 1 \times (T - 20)$ $\Rightarrow T = 30$ | |
| | 實戰模擬 檢測解析 Q12 | 歐姆：電阻單；安培：電流；焦耳：能量。 | 歐姆：電阻；安培：電流；焦耳：能量。 | |

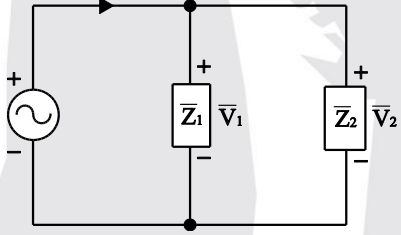
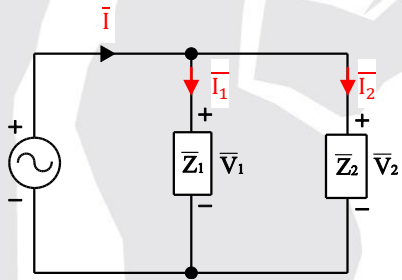
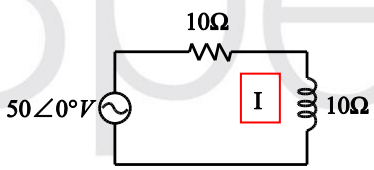
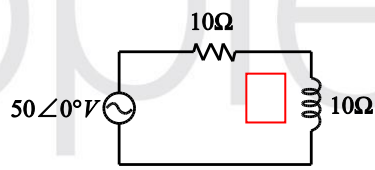
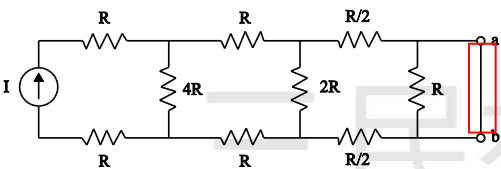
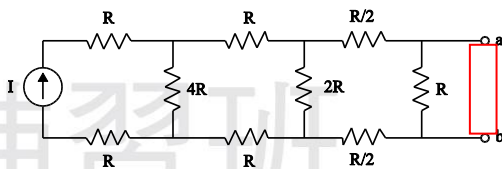
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|----|---------------------|---|--|--|
| 25 | 實戰模擬 檢測解析 Q17 | $\frac{10}{12} = \frac{\frac{1}{\alpha_0} + 20}{\frac{1}{\alpha_0} + 50}$ 解之 $\frac{1}{\alpha_0} = \frac{1}{130} = 0.0077$ | $\frac{10}{12} = \frac{\frac{1}{\alpha_0} + 20}{\frac{1}{\alpha_0} + 50} \Rightarrow \alpha_0 = \frac{1}{130} = 0.0077$ | |
| 41 | 實戰模擬 檢測解析 Q6 | $I = \frac{20 - 4}{2k + 6k} = 2mA \quad \therefore R = \frac{4}{2m} = 2k\Omega$ | $I = \frac{20 - 4}{2k + 6k} = 2mA \quad \therefore R = \frac{4}{2m} = 2k\Omega$ | |
| | 實戰模擬 檢測解析 Q14 | $V_b = 12 \times \frac{4}{8 + 4} = 4V$ $\Rightarrow V_a - V_b = 8 - 4 = 4B$ | $V_b = 12 \times \frac{4}{8 + 4} = 4V$ $\Rightarrow V_a - V_b = 8 - 4 = 4V$ | |
| 42 | 實戰模擬 檢測解析 Q24 | $V_x = -10 \times \frac{20}{15 + 10 + 5 + 20} = -4V$ | $V_x = -10 \times \frac{20}{15 + 10 + 5 + 20} = -4V$ | |
| | 實戰模擬 檢測解析 Q27 | $V_{R_2} = 40 \times \frac{R_2}{R_1 + R_2} = \frac{40}{6}$ | $V_{R_2} = 40 \times \frac{R_2}{R_1 + R_2} = \frac{40}{6}$ | |
| | 實戰模擬 檢測解析 Q30 | a、b 兩點間為 短路 $\therefore V_b = V_a = 60V$ | a、b 兩點間為 斷路 $\therefore V_b = V_a = 60V$ | |
| 48 | 範例練習 解析 | (4)將上式分別代入(1)式得： $\frac{24 - V_A}{6} = \frac{V_A + 12}{2} = \frac{V_A}{3}$ | (4)將上式分別代入(1)式得： $\frac{24 - V_A}{6} = \frac{V_A + 12}{2} + \frac{V_A}{3}$ | |
| 49 | 範例練習 解析 | (4)依歐姆定律並代入上式可得： $\frac{V_B}{3} = \frac{V_B + 6}{2} = \frac{12 - V_B}{6}$ | (4)依歐姆定律並代入上式可得： $\frac{V_B}{3} + \frac{V_B + 6}{2} = \frac{12 - V_B}{6}$ | |
| 56 | 範例練習 解析 |  依節點電壓法： $\frac{V_A - 12}{6} + \frac{V_A + 6}{3} + 5 = 0$ |  依節點電壓法： $\frac{V_A - 12}{6} + \frac{V_A + 6}{3} + 5 = 0$ | |
| 61 | 第二行下 的圖說 | 戴維寧等效 網路 諾頓等效 網路 | 戴維寧等效 電路 諾頓等效 電路 | |

| | | | | |
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| 65 | 二、公式 | $V_{ab} = \frac{\frac{E_1}{R_1} + \frac{E_2}{R_2} + \frac{E_2}{R_2} + \frac{E_2}{R_2} + \dots + \frac{E_2}{R_2}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \dots + \frac{1}{R_N}}$ $= \frac{\sum_{k=1}^N \frac{E_k}{R_k}}{\sum_{k=1}^N \frac{1}{R_k}} = \frac{\sum_{k=1}^N E_k \times G_k}{\sum_{k=1}^N G_k}$ | $V_{ab} = \frac{\frac{E_1}{R_1} + \frac{E_2}{R_2} + \frac{E_3}{R_3} + \frac{E_4}{R_4} + \dots + \frac{E_N}{R_N}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \dots + \frac{1}{R_N}}$ $= \frac{\sum_{k=1}^N \frac{E_k}{R_k}}{\sum_{k=1}^N \frac{1}{R_k}} = \frac{\sum_{k=1}^N E_k \times G_k}{\sum_{k=1}^N G_k}$ | |
| | 第一行 | $\Rightarrow V_{ab} = \frac{\frac{E_1}{R_1} + \frac{E_2}{R_2} + \frac{E_2}{R_2} + \frac{E_2}{R_2} + \dots + \frac{E_2}{R_2}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \dots + \frac{1}{R_N}}$ | $\Rightarrow V_{ab} = \frac{\frac{E_1}{R_1} + \frac{E_2}{R_2} + \frac{E_3}{R_3} + \frac{E_4}{R_4} + \dots + \frac{E_N}{R_N}}{\frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \frac{1}{R_4} + \dots + \frac{1}{R_N}}$ | |
| | 第三行 | $V_{ab} = \frac{I_1 + I_2 + I_3 + \dots + I_N}{\frac{1}{R_1} + \frac{1}{R_1} + \frac{1}{R_1} + \frac{1}{R_1} + \dots + \frac{1}{R_1}}$ $= \frac{I_1 + I_2 + I_3 + \dots + I_N}{G_1 + G_2 + G_3 + \dots + G_N}$ | $V_{ab} = \frac{I_1 + I_2 + I_3 + \dots + I_N}{\frac{1}{R_1} + \frac{1}{R_1} + \frac{1}{R_2} + \frac{1}{R_3} + \dots + \frac{1}{R_N}}$ $= \frac{I_1 + I_2 + I_3 + \dots + I_N}{G_1 + G_2 + G_3 + \dots + G_N}$ | |
| 66 | 範例練習 解析 | <p>(1)利用密爾門定理：</p> $V_{ab} = \frac{\frac{24}{6} + \frac{36}{12} + \frac{0}{3} + \frac{20}{4}}{\frac{1}{6} + \frac{1}{12} + \frac{1}{3} + \frac{1}{4}}$ $= \frac{4 + 3 + 0 + 5}{\frac{2 + 1 + 4 + 3}{12}} = 2.4 \text{ (V)}$ <p>(2)先將 a、b 斷路，再利用密爾門定理求 V_{TH}：</p> $V_{TH} = \frac{\frac{24}{6} + \frac{36}{12} + \frac{20}{4}}{\frac{1}{6} + \frac{1}{12} + \frac{1}{4}} = \frac{4 + 3 + 5}{\frac{2 + 1 + 3}{12}} = 4 \text{ (V)}$ | <p>(1)利用密爾門定理：</p> $V_{ab} = \frac{\frac{24}{6} + \frac{36}{12} + \frac{0}{3} - \frac{20}{4}}{\frac{1}{6} + \frac{1}{12} + \frac{1}{3} + \frac{1}{4}}$ $= \frac{4 + 3 + 0 - 5}{\frac{2 + 1 + 4 + 3}{12}} = 2.4 \text{ (V)}$ <p>(2)先將 a、b 斷路，再利用密爾門定理求 V_{TH}：</p> $V_{TH} = \frac{\frac{24}{6} + \frac{36}{12} - \frac{20}{4}}{\frac{1}{6} + \frac{1}{12} + \frac{1}{4}} = \frac{4 + 3 - 5}{\frac{2 + 1 + 3}{12}} = 4 \text{ (V)}$ | |
| 73 | 實戰模擬 檢測解析 Q4 | <p>由節點電壓法可得</p> $\frac{V - 16}{4} + \frac{V - 24}{3} + \frac{V - 6}{12} = 0 \Rightarrow V = 13V$ | <p>由節點電壓法可得</p> $\frac{V - 16}{4} + \frac{V - 12}{6} + \frac{V - 6}{12} = 0 \Rightarrow V = 13V$ | |
| | 實戰模擬 檢測解析 Q9 | $\frac{1}{500K} = \frac{1}{2K} + \frac{1}{4K} + \frac{1}{R} \Rightarrow R = 800\Omega$ | $\frac{1}{0.5K} = \frac{1}{2K} + \frac{1}{4K} + \frac{1}{R} \Rightarrow R = 800\Omega$ | |
| 74 | 實戰模擬 檢測解析 Q19 | <p>利用節點電壓法</p> $i_1 + \frac{V}{2} + 2i_1 + 4 \Rightarrow i_1 = \frac{V}{6} \cdot \text{可得 } V = 12V$ | <p>利用節點電壓法</p> $\begin{cases} i_1 + \frac{V}{2} = 2i_1 + 4 \\ i_1 = \frac{V}{6} \end{cases} \cdot \text{可得 } V = 12(V)$ | |

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| | 實戰模擬 檢測解析 Q20 | $R_{TH} = (6 \parallel 4) + (3 \parallel 2) = \frac{8}{5} \Omega$ | $R_{TH} = (6 \parallel 4) + (3 \parallel 2) = \frac{18}{5} (\Omega)$ | |
| | 實戰模擬 檢測解析 Q21 | $R_{TH} = 6 \parallel 4 = \frac{12}{8} = 1.5 \Omega$ | $R_{TH} = 6 \parallel 2 = \frac{12}{8} = 1.5 \Omega$ | |
| | 實戰模擬 檢測解析 Q22 | 此為惠斯登電橋，對 2Ω 電阻而言，電壓源為提供電能，故可以只考慮電流源的部分。 | 此為惠斯登電橋，對 2Ω 電阻而言，電壓源未提供電能，故可以只考慮電流源的部分。 | |
| 81 | 範例練習 解析 | (3) $1\mu\text{F}$ 充電電量 $Q_1 = 100 \times 1 = 100\mu\text{C}$ $2\mu\text{F}$ 充電電量 $Q_1 = 100 \times 2 = 200\mu\text{C}$ $6\mu\text{F}$ 充電電量 $Q_2 = 50 \times 6 = 300\mu\text{C}$ | (3) $1\mu\text{F}$ 充電電量 $= 100 \times 1 = 100\mu\text{C}$ $2\mu\text{F}$ 充電電量 $= 100 \times 2 = 200\mu\text{C}$ $6\mu\text{F}$ 充電電量 $= 50 \times 6 = 300\mu\text{C}$ | |
| 85 | 範例練習 第三題(4) | 求電登平均消耗功率。 | 求電容平均消耗功率。 | |
| 89 | 實戰模擬 檢測解析 Q8 | $C = \epsilon \frac{A}{d} = 8.85 \times 10^{-12} \times \frac{3 \times 10}{0.1} = 26.6\text{PF}$ | $C = \epsilon \frac{A}{d} = 8.85 \times 10^{-12} \times \frac{3 \times 10 \times 10^{-4}}{0.1 \times 10^{-2}} = 26.6\text{PF}$ | |
| 90 | 實戰模擬 檢測解析 Q19 | $\therefore C_2 = \frac{10\mu}{5} = 2\mu\text{F}$ | $\therefore C_3 = \frac{10\mu}{5} = 2\mu\text{F}$ | |
| | 實戰模擬 檢測解析 Q24 | $W = QV \times V \Rightarrow V = 1\text{V}$ | $W = Q \times V \Rightarrow V = 1\text{V}$ | |
| 105 | 實戰模擬 檢測解析 Q7 | $\frac{N_1}{N_2} = \frac{V_1}{V_2} \Rightarrow \frac{100}{10} = \frac{240}{V_2}$ $\therefore V_2 = 24\text{V}$ $\frac{N_1}{N_2} = \frac{i_2}{i_1} \Rightarrow \frac{100}{10} = \frac{240}{i_1}$ $\therefore i_1 = 0.01\text{A}$ | $\frac{N_1}{N_2} = \frac{V_1}{V_2} \Rightarrow \frac{100}{10} = \frac{240}{V_2}$ $\therefore V_2 = 24\text{V}$ $\frac{N_1}{N_2} = \frac{i_2}{i_1} \Rightarrow \frac{100}{10} = \frac{0.1}{i_1}$ $\therefore i_1 = 0.01\text{A}$ | |
| 106 | 實戰模擬 檢測解析 Q13 | $W = \frac{1}{2} L_1 L_2^2 - M I_1 I_2 = 325 - 255 = 70\text{J}$ | $W = \frac{1}{2} L_1 I_1^2 + \frac{1}{2} L_2 I_2^2 - M I_1 I_2 = 325 - 255 = 70\text{J}$ | |

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| | 實戰模擬 檢測解析 Q14 | $\frac{16}{4} = \frac{500^2}{D} \Rightarrow D = 250$ | $\frac{16}{4} = \left(\frac{500}{D}\right)^2 \Rightarrow D = 250$ | |
| | 實戰模擬 檢測解析 Q17 | 因 L 與 N 成反比 $\frac{10}{2.5} = \frac{100^2}{N} \Rightarrow N = 50$ | 因 L 與 N 成反比 $\frac{10}{2.5} = \left(\frac{100}{N}\right)^2 \Rightarrow N = 50$ | |
| 110 | 範例練習 解析 | (1) $\tau = RC = 50 \times 10 \times 10^{-6} = 2$ 秒 | (1) $\tau = RC = 50 \times 10 \times 10^{-6} = 5 \times 10^{-4}$ 秒 | |
| 123 | 第 8 題 |  |  | |
| 126 | 實戰模擬 檢測解析 Q11 | $I_{2\Omega} = \frac{5 + 6 \times 3}{2 + 3} = 4.6V$ | $I_{2\Omega} = \frac{5 + 6 \times 3}{2 + 3} = 4.6A$ | |
| | 範例練習 一解析 | $(3)v\left(\frac{1}{120}\right) = 100 \sin\left(360^\circ \times 60^\circ \times \frac{1}{120} + 30^\circ\right)$ | $(3)v\left(\frac{1}{120}\right) = 100 \sin\left(360^\circ \times 60 \times \frac{1}{120} + 30^\circ\right)$ | |
| 131 | 範例練習 二解析 | (2) $f = \frac{377}{2\pi} = 60\text{Hz} \quad \therefore T = \frac{1}{f} = \frac{1}{50}$ 秒 (3) $v\left(\frac{1}{150}\right) = 100 \sin\left(360^\circ \times 50 \times \frac{1}{150} - 30^\circ\right)$ $= 100 \sin(120^\circ) = 50\sqrt{3}V$ | (2) $f = \frac{314}{2\pi} = 50\text{Hz} \quad \therefore T = \frac{1}{f} = \frac{1}{50}$ 秒 (3) $v\left(\frac{1}{150}\right) = 100 \sin\left(360^\circ \times 50 \times \frac{1}{150} - 60^\circ\right)$ $= 100 \sin(60^\circ) = 50\sqrt{3}V$ | |
| 145 | 範例一 |  |  | |

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| 146 | 範例二 |  |  |
| | 範例二 解析 | (4) $PF = \cos\theta = \frac{R}{Z} = \cos 60^\circ = 0.866$ | (4) $PF = \cos\theta = \frac{R}{Z} = \cos 30^\circ = 0.866$ |
| 149 | 倒數二行 | $\frac{1}{Z} = \frac{1}{R} - j\frac{1}{X_L} = \frac{1}{R} + \frac{1}{jX_L} = \frac{R \cdot jX_L}{R + jX_L}$ | $\frac{1}{Z} = \frac{1}{R} - j\frac{1}{X_L} = \frac{1}{R} + \frac{1}{jX_L} = \frac{R + jX_L}{R \cdot jX_L}$ |
| 158 | 範例練習 題目 |  |  |
| 158 | 範例練習 解析(1)左 圖 |  |  |
| 158 | 範例練習 解析(1)右 圖 |  |  |
| 158 | 範例練習 解析(3) | (3) $\vec{V}_{TH} = \vec{V}_{ab} = (5 - j5)(5 + j5) + 50\angle 0^\circ = 100\angle 0^\circ V$ | (3) $\vec{V}_{TH} = \vec{V}_{ab} = (5 - j5)(5 + j5) + 50\angle 0^\circ = 100\angle 0^\circ V$ |
| 160 | 範例練習 解析(2) | $\vec{I}_N = 10\angle 0^\circ \times \frac{-j6}{j8 - j6} = -30\angle 0^\circ = 10\angle 0^\circ V$ | $\vec{I}_N = 10\angle 0^\circ \times \frac{-j6}{j8 - j6} = -30\angle 0^\circ = 30\angle 180^\circ A$ |
| 168 | 實戰模擬 檢測解析 Q18 | $\vec{V} = 100\angle -10^\circ V$ $\vec{I} = \frac{\vec{V}}{R} = \frac{100\angle -10^\circ}{10} = 10\angle -10^\circ A$ $\therefore i = 10\sin(377t - 10^\circ)$ | $\vec{V} = \frac{100}{\sqrt{2}}\angle -10^\circ V$ $\vec{I} = \frac{\vec{V}}{R} = \frac{\frac{100}{\sqrt{2}}\angle -10^\circ}{10} = \frac{10}{\sqrt{2}}\angle -10^\circ A$ $\therefore i = 10\sin(377t - 10^\circ)$ |

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| 169 | 實戰模擬 檢測解析 Q20 | $\bar{V}_C = 5\angle 0^\circ \times 25\angle -90^\circ = 125\angle -90^\circ$ $\therefore V_C(t) = 125\sin(377t - 90^\circ)$ | $\bar{V}_C = \frac{5}{\sqrt{2}} \angle 0^\circ \times 25\angle -90^\circ = \frac{125}{\sqrt{2}} \angle -90^\circ$ $\therefore V_C(t) = 125\sin(377t - 90^\circ)$ |
| 171 | (二)標題 第一行 | (-) $X_L > X_C$ | (-) $X_L < X_C$ |
| 178 | 並聯電路 分流定則 |  |  |
| 197 | 範例二 解析(4) | (4) $PF = \frac{P}{S} = \frac{600}{\sqrt{750^2 + 1000^2}} = 0.6$ 滯後 | (4) $PF = \frac{P}{S} = \frac{750}{\sqrt{750^2 + 1000^2}} = 0.6$ 滯後 |
| 203 | 實戰模擬 檢測解析 Q16 | $P = \frac{1}{2} VI \cos\theta = \frac{1}{2} \times 50 \times 16 \times \cos 30^\circ$ $= 346.3W$ | $P = \frac{1}{2} VI \cos\theta = \frac{1}{2} \times 50 \times 16 \times \cos 30^\circ$ $= 346.4W$ |
| | 實戰模擬 檢測解析 Q19 | $pf = \frac{8}{\sqrt{8^2 + 6^2}} = 0.8$ | $PF = \frac{8}{\sqrt{8^2 + 6^2}} = 0.8$ |
| 207 | 範例二 解析(1) | $\therefore L = \frac{1}{2\pi \times 100} = \frac{1}{\pi} H$ | $\therefore L = \frac{200}{2\pi \times 100} = \frac{1}{\pi} H$ |
| 105-7 | 7 題 | $\eta = 0.8 \times 0.75 = 0.6 = \frac{P_{in}}{600}$ $\Rightarrow P_{in} = 1000(W)$ · 故選(D) · | $\eta = 0.8 \times 0.75 = 0.6 = \frac{600}{P_{in}}$ $\Rightarrow P_{in} = 1000(W)$ · 故選(D) · |
| 105-27 | 27 題 |  |  |
| 106-3 | 13 題 |  |  |

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|--------|------------|--|--|
| 106-30 | 10 題 解析 | | |
| 107-1 | 1 題 | | |
| 107-4 | 22 題 | | |
| 107-29 | 36 題 | | |
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| 108-5 | 23 題 | | |
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| 108-72 | 15 題 | | |

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更新紀錄

2020/03/03 新增第 74 頁修訂。

2020/04/22 新增第 13、24、25、41、56、61、74、123、145、146、158、171、178、105-7、105-27、106-3、106-30、107-1、107-4、107-29、107-45、107-46、107-49、108-4、108-5、108-30、108-38、108-46、108-72 頁修訂。

2020/05/08 新增第 41、42、48、49、65、66、73、74、81、85、89、90、105、106、110、123、126、131、149、158、160、168、169、197、203、207



3people

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