

فصل 10 کتاب نیلسون، فصل 11 کتاب الکساندر، فصل 7 کتاب جبه‌دار

• توان در حالت دائم سینوس

○ توان لحظه‌ای

○ توان متوسط

▪ جمع‌پذیری توان متوسط: با منابع هم فرکانس خیر ولی با منابع مختلف‌الفرکانس بله

$$P \triangleq \frac{1}{2} V \bar{I} \quad \rightarrow \quad p_{av} = \text{Re}(P) \quad \text{توان مختلط:} \quad \circ$$

○ مقادیر موثر ولتاژ و جریان

• حل P. 10-18 از کتاب نیلسون

Practice Problem 11.4

Calculate the average power absorbed by each of the five elements in the circuit of Fig. 11.6.

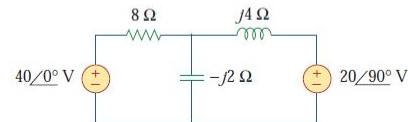


Figure 11.6

For Practice Prob. 11.4.

Answer: 40-V Voltage source: -60 W; $j20$ -V Voltage source: -40 W; resistor: 100 W; others: 0 W.

• انتقال توان ماکزیمم

$$X_L = -X_S \quad \text{and} \quad \sqrt{R_S^2 + (X_L + X_S)^2} \quad \circ$$

○ مقدار توان ماکزیمم

Practice Problem 11.5

For the circuit shown in Fig. 11.10, find the load impedance Z_L that absorbs the maximum average power. Calculate that maximum average power.

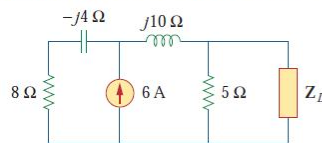


Figure 11.10

For Practice Prob. 11.5.

Answer: $3.415 - j0.7317 \Omega$, 12.861 W.

In Fig. 11.12, the resistor R_L is adjusted until it absorbs the maximum average power. Calculate R_L and the maximum average power absorbed by it.

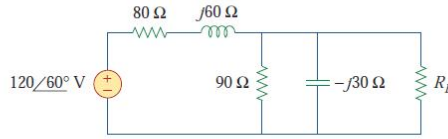


Figure 11.12
For Practice Prob. 11.6.

Answer: 30 Ω, 6.863 W.

11.16 For the circuit of Fig. 11.47, find the maximum power delivered to the load Z_L .

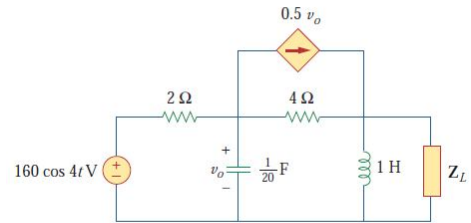


Figure 11.47
For Prob. 11.16.

11.20 The load resistance R_L in Fig. 11.51 is adjusted until it absorbs the maximum average power. Calculate the value of R_L and the maximum average power.

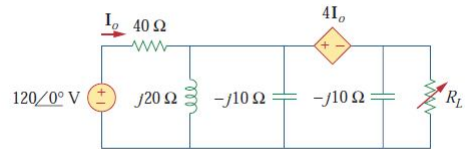


Figure 11.51
For Prob. 11.20.