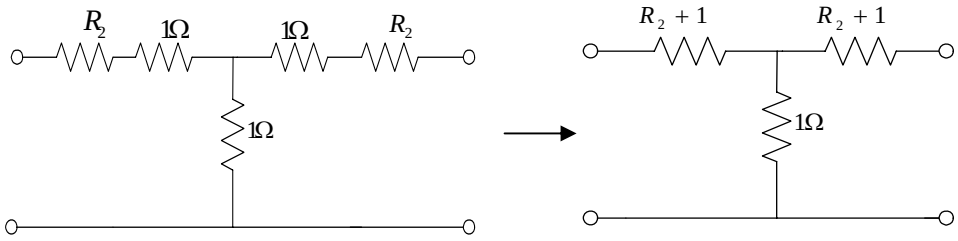
第一篇　阻抗轉換 練習題解答

1. (D)

$$Z_A = 5\times 10\times(\frac{1}{5}+\frac{1}{10}+\frac{1}{j5}) = 50\times\frac{10+j15}{j50} = 15\text{-}j10$$

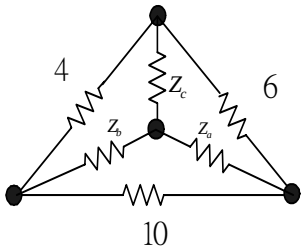
2. (B)

圖(b)經Δ→Y 互換可得



與圖(a)比較可得　　$R_1=1\Omega$　，　$R_2=2\Omega$

3. (A)



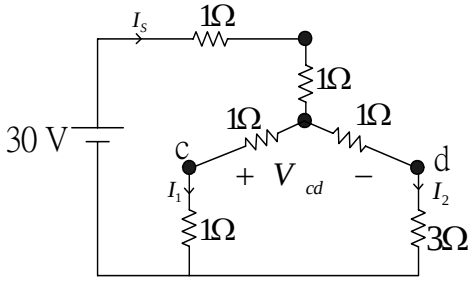
$$Z_a=\frac{6\times 10}{4+6+10}=3\Omega$$

$$Z_b=\frac{4\times 10}{4+6+10}=2\Omega$$

$$Z_c=\frac{4\times 6}{4+6+10}=1.2\Omega$$

4. (A)

Δ－Y 互換



$$R_{ab}=[(1+1)//(1+3)]+2=3\frac{1}{3}\ \Omega$$

5. (B)

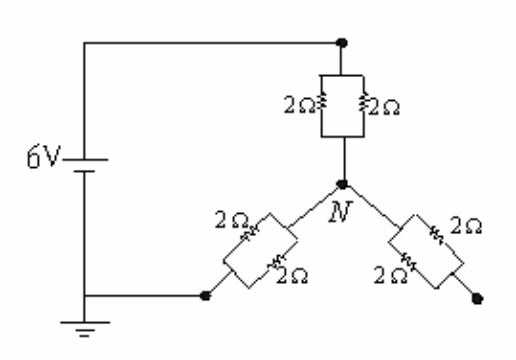
$$I_S=\frac{30}{R_{ab}}=9(\text{A})$$

$$\begin{cases} I_1=\dfrac{4}{2+4}\times 9=6 & \Rightarrow Vc=1\times I_1=6(V) \\ I_2=\dfrac{2}{2+4}\times 9=3 & \Rightarrow Vd=3\times I_1=9(V) \end{cases}$$

分流處理

Vcd=Vc-Vd=-3(V)

6. (D)



$$V_N=\frac{1}{1+1}\times 6=3V$$

7. (D) $Z_1=10K$，$Z_2=j\omega L$，$Z_3=5K$，$Z_4=\dfrac{1}{j\omega c}$

電橋平衡 $Z_1Z_4=Z_2Z_3$，$C=\dfrac{L}{5K\times 10K}=20pF$

8. (C)

9. (A)

$1K\times 5.6K = 1.6K\times 3.5K$

電橋平衡 $I_G=0$

10. (A)

電橋平衡：

$R\times j5 = 3\times j3$ → $R=\dfrac{9}{5}\Omega$