

所別： 電機研究所 組別： 電力與電能轉換 科目： 電路學

注意： 不准 一般計算器 工程用計算器，考試時間：100 分鐘。試題共 2 頁，第 1 頁

1. Consider the periodic voltage waveform $v(t)$ shown in figure 1 with a frequency of 60Hz and a peak value V_m of 155V. Determine

- (1) The dc value V_{dc} of the voltage $v(t)$? (write down the prove process not just the answer) (5 分)
- (2) The rms value V_{rms} of the voltage $v(t)$? (write down the prove process not just the answer)(5 分)
- (3) If this voltage appears across a 50Ω resistance, determine the average power? (5 分)

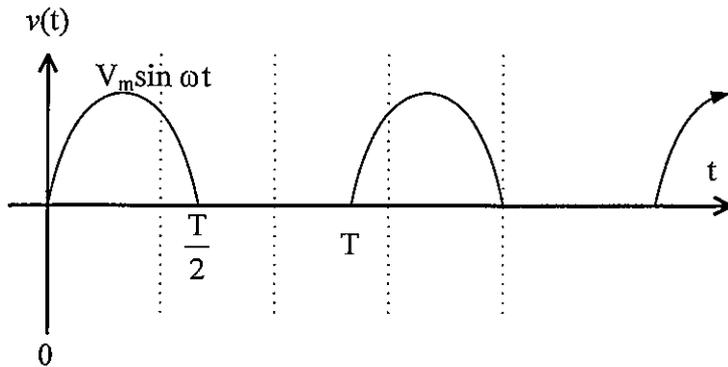


figure 1

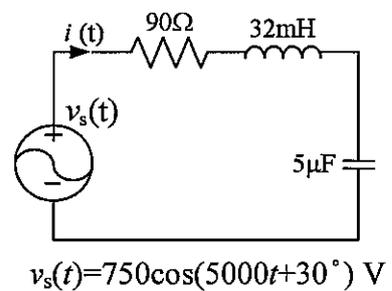


figure 2

2. (1) Calculate the current $i(t)$ in the figure 2? (5 分)
- (2) Calculate the power \bar{S} , $|S|$, P , Q , and PF in the figure 2? (15 分)
3. The circuit was shown in figure 3, find V_x ? (15 分)

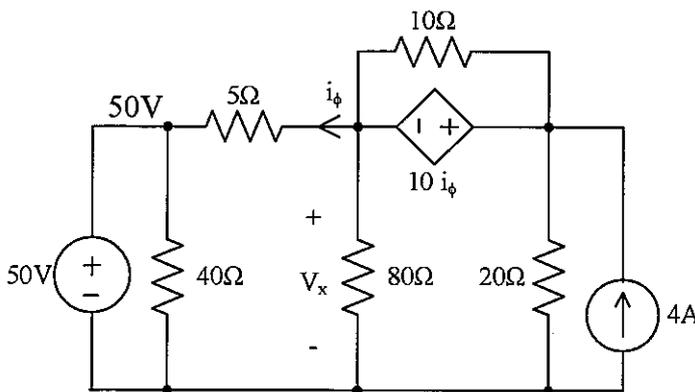


figure 3

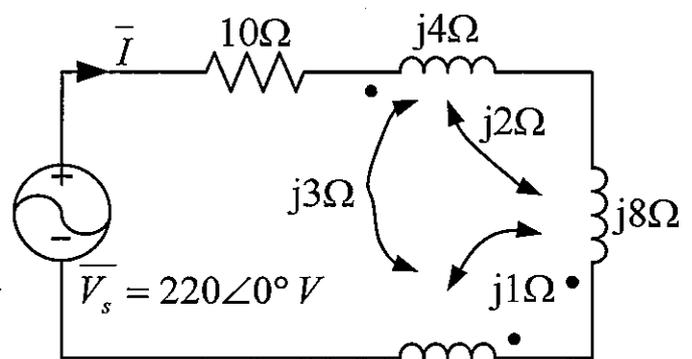


figure 4

4. The coupled circuit was shown in figure 4, find $\bar{I} = ?$ (15 分)

~背面尚有試題~

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5. In a balanced three phase system as shown in figure 5, with $\bar{V}_a = 110\angle 0^\circ \text{V}$, $\bar{Z}_A = 11\angle 30^\circ \Omega$, $f = 60\text{Hz}$, line impedance $R = 1\Omega$, and $L = \frac{1}{120\pi} \text{H}$, find \bar{V}_A , \bar{I}_A , and \bar{I}_{aA} ? (15分)

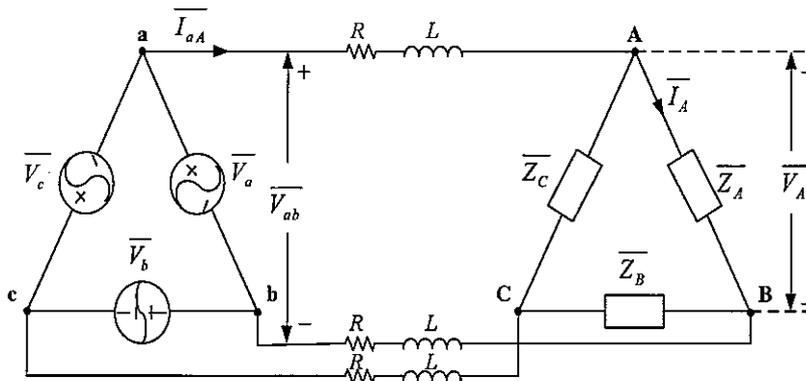


figure 5

6. The circuit was shown in figure 6,

- (1) find the s-domain expression of v_o , (5 分)
- (2) use the s-domain expression derived in (1) to predict the initial and final values of v_o , (5 分)
- (3) find the time-domain expression of v_o . (10 分)

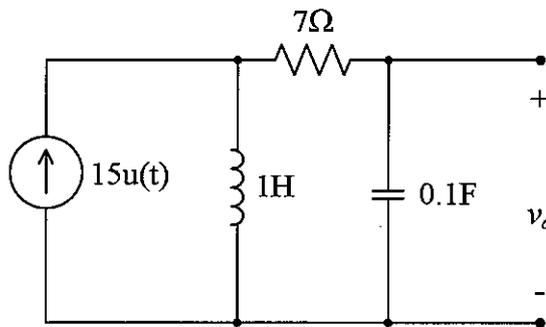


figure 6