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107 學年度研究所碩士班招生考試
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試題 共 2 頁，第 1 頁

- 注意：a. 本試題共 五 題，每題 20 分，共 100 分
b. 作答時不必抄題
c. 考生作答前請詳閱答案卷之考生注意事項

1. For the circuit shown in Fig. 1, find the value of current i_a and the power absorbed by the dependent voltage source.

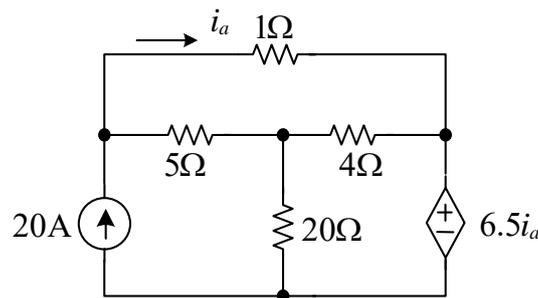


Fig. 1

2. In the circuit in Fig.2 the voltage and current expressions are

$$v = 32e^{-500t}V, \quad i = 8e^{-500t}mA, \quad t > 0$$

Find the time constant of this circuit and the values of R and C.

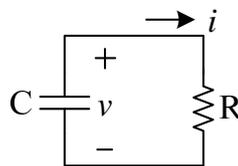


Fig. 2

【背面尚有試題】

3. In the circuit shown in Fig. 3, a load having an impedance of $120+j90\ \Omega$ is fed from a voltage source through a line having an impedance of $3+j4\ \Omega$. The effective value of the source voltage is 465V and source frequency is 60Hz.
- (a) Calculate the average and reactive power delivered by the voltage source.
- (b) Calculate the size of the capacitor in microfarads that when connected in parallel with the load will make the load look purely resistive.

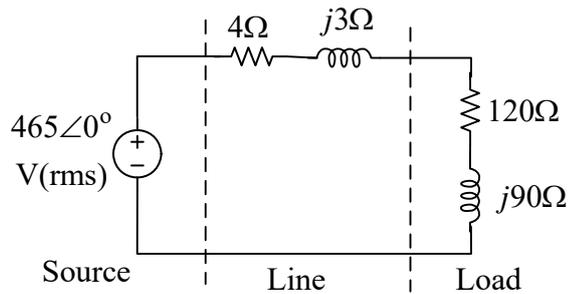


Fig. 3

4. If the switch in Fig. 4 has been closed for a long time before $t = 0$ but is opened at $t = 0$.
- (a) Find the s-domain response $I(s)$.
- (b) Find the t-domain response $i(t)$ for $t \geq 0$.

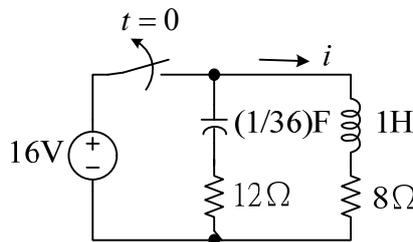


Fig. 4

5. A balanced Δ -connected three-phase load has an impedance of $Z_o = 85.5+j114\ \Omega/\phi$ as in Fig.5. The load is fed through a line having an impedance of $Z_{line} = 1.5+j2.0\ \Omega/\phi$. The phase voltage at terminal of the source is $V_{an} = 250\angle 0^\circ\text{V(rms)}$. The phase sequence is positive.
- (a) Calculate the line current I_{aA} .
- (b) Calculate the load terminal voltage V_{BC} .

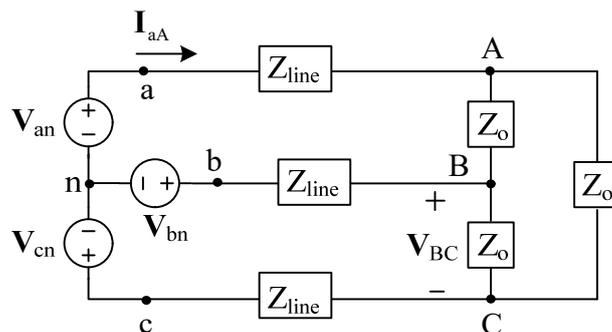


Fig. 5