

國立臺北科技大學

九十四學年度電力電子產業研發碩士專班入學考試

基本電學試題

填准考證號碼

第一頁 共二頁

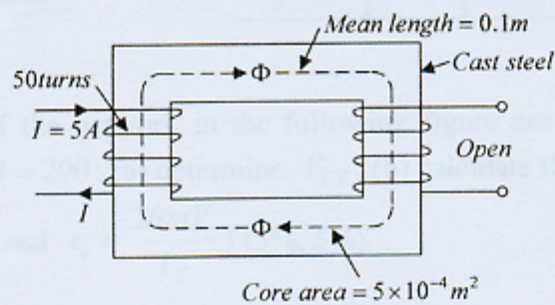
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注意事項：

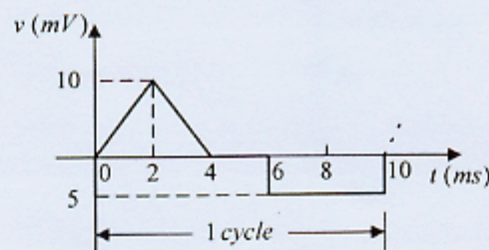
1. 本試題共十題，配分共 100 分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在答案卷之答案欄內，否則不予計分。

1. Determine the flux in the core of the transformer in the following figure. The transformer has the following characteristics: (10%)

H (At/m)	1250	2500	5000
B (T)	1.2	1.42	1.5

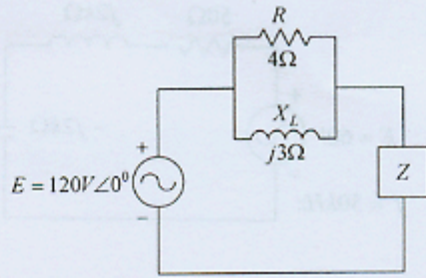


2. Calculate the average value of the following waveform over one full cycle. (5%)

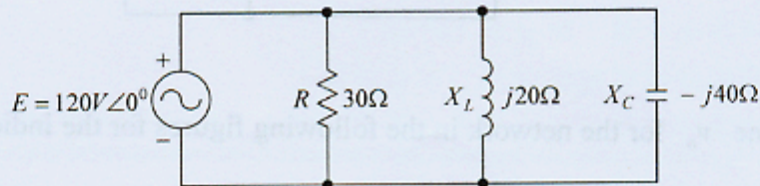


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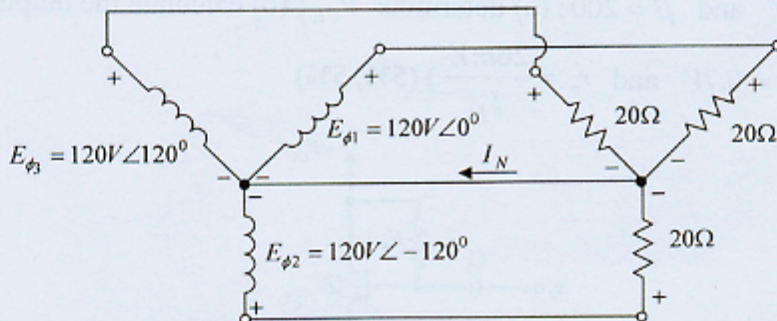
3. For the network in the following figure, determine: (a) the load impedance Z for the maximum power transfer; (b) the maximum power delivered. (5%, 5%)



4. For the parallel RLC circuit in the following figure, determine: (a) the total power dissipated; (b) the total apparent power; (c) the power factor of the network. (5%, 5%, 5%)

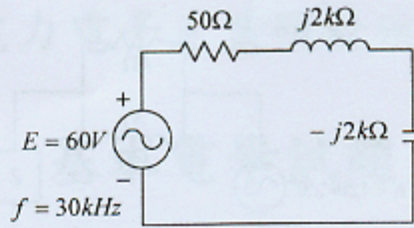


5. A $1kW$ motor has a 0.8 lagging power factor and an efficiency of 80% when connected to a 100V, 15 rad/s supply. Determine the level of capacitance placed in parallel with the motor that will raise the power factor of the system to unity. (10%)
6. For the Y-Y connected, three-phase, four-wire system in the following figure, determine: (a) the magnitude of the load line voltages; (b) the neutral current I_N . (5%, 5%)

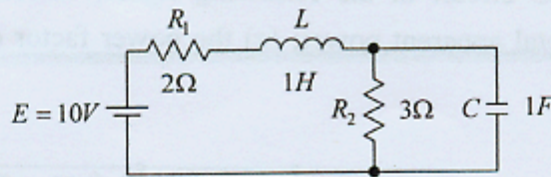


注意：背面尚有試題

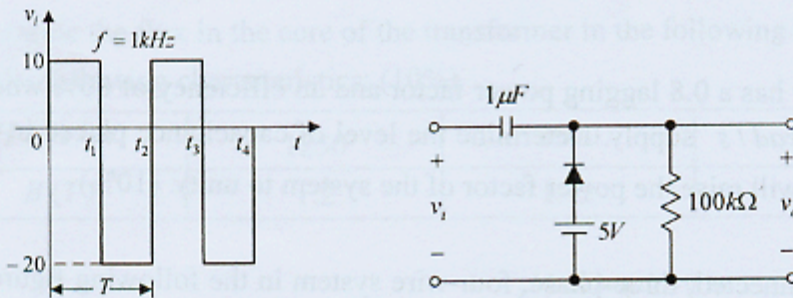
7. For the series RLC circuit in the following figure, determine: (a) the bandwidth; (b) the power delivered at the half-power frequencies (HPFs). (5%, 5%)



8. In the following circuit, determine: (a) the energy stored in L in the steady state; (b) the energy stored in C in the steady state. (5%, 5%)



9. Determine v_o for the network in the following figures for the indicated input. (10%)



10. If the parameters of the network in the following figure are $R_B = 1M\Omega$, $R_E = 5k\Omega$, $V_{CC} = 10.7V$ and $\beta = 200$: (a) determine V_{CE} ; (b) calculate the output impedance Z_o .

(Note: $V_{BE} = 0.7V$ and $r_e = \frac{26mV}{I_E}$) (5%, 5%)

