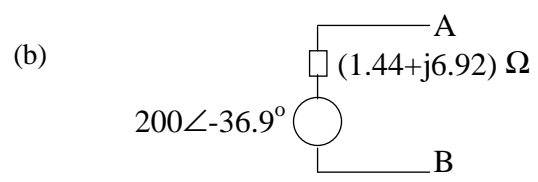
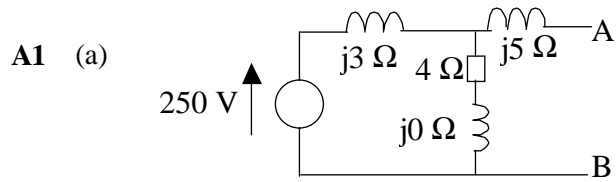




**UEE 201 - THEORY OF ELECTRICITY - Answers**

**Final Part I Examination 1998/99 - September 2000**



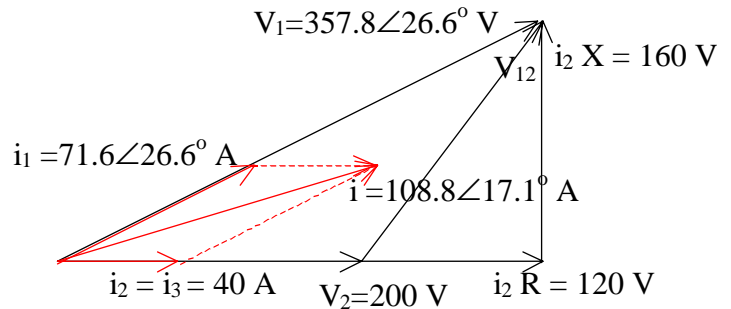
(c)  $1.838 \angle 36.03^\circ \Omega$

(d) 
$$\begin{bmatrix} 0.32 - j0.16 & -0.12 + j0.16 \\ -0.12 + j0.16 & 0.32 - j0.16 \end{bmatrix}$$

(e)

(f)  $24.81 \angle 10.37^\circ \text{ V}$

(g) 2.12 kW, 10.54 A, 9.90 A, 36.5%



**A2**  $22.92 \angle 2.36^\circ \text{ A}$ ,  $22.95 \angle 2.58^\circ \text{ A}$ ,  $0.09 \angle -77.5^\circ \text{ A}$

**A3** (a)  $R = 0.5 x$ ,  $X = -0.5 x$ ,  $P_{\max} = \frac{E^2}{x}$  (b)  $L = 92.9 \text{ mH}$

**A4** (a)  $8.105 \angle -28.32^\circ \text{ A}$ , 0.880 lag  
(b) 3 of  $6.90 \mu\text{F}$  (or 346.67 var)

**A5** (a) 0 V, (b)  $692.8 \angle 150^\circ \text{ V}$ , (c) 0 V.

**A6**  $5 + 6.98 \sin(\omega_0 t - 34.85^\circ) + 3.72 \sin(3\omega_0 t - 80.13^\circ) + \dots \text{ A}$  where  $\omega_0 = \pi/4 \text{ T}$

**A7** (a) standard derivation  
(b)  $5e^{-500t} \cos 3122.5t + 0.8006e^{-500t} \sin 3122.5t \text{ A}$