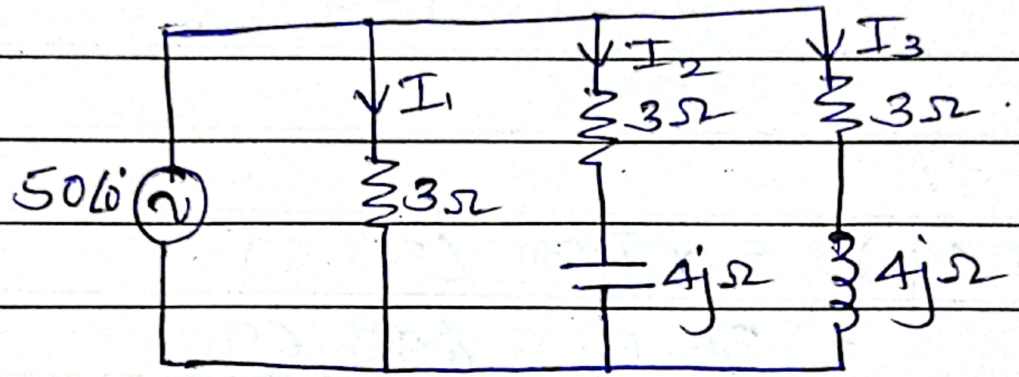
First Year of Engineering

Internal Test - III

Q.1 Voltage leads current by 90°.

Q.3



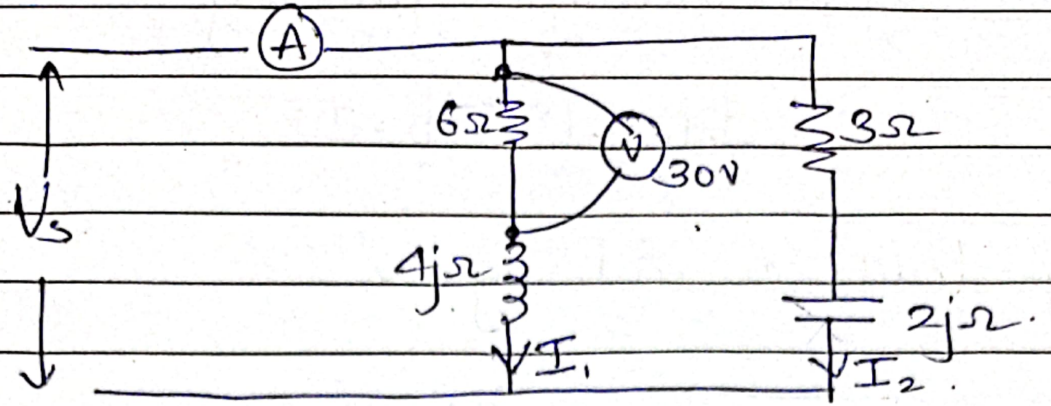
$$I_2 = \frac{50\angle 0^\circ}{3-4j} = \frac{50\angle 0^\circ}{5\angle -53^\circ} = 10\angle 53^\circ = (6+8i)\,A.$$

Q.2 $R = 5\Omega$. $X_L = 6.77\Omega$.

$Z = (5 + j6.77)\Omega = 8.41\angle 53.55$

$\therefore \cos\phi = 0.59$ Lagging.

Q4].



$\therefore I_1 = 30/6 = 5A$

$\therefore V_s = 5(6+4j) = 5 \times 7.211 \angle 33.69$

$= 36.055 \angle 33.69$

$= (30+20i)\ V.$

5) 400V, 50Hz.

$I_L = 20A \text{ lag } 50°$

$\therefore V_L = \sqrt{3}\ V_{ph}$

$V_{ph} = 231V.$

$\therefore Z = \frac{V_{ph}}{I_{ph}} = \frac{231\angle 0°}{20\angle -50°} = 11.55 \angle +50° = 7.4 + 8.8i$

$= 7.4\Omega,\ 8.8\Omega.$