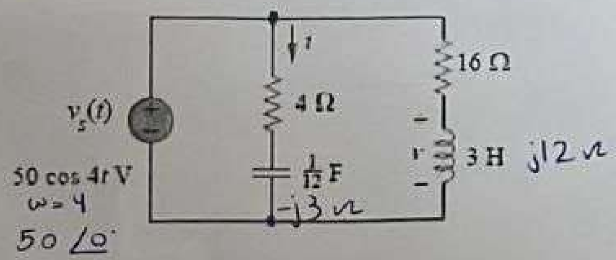
**For the circuit shown, answer questions (22-25)

$Z\left(\frac{1}{12F}\right) = \frac{1}{\frac{1}{12}(4)} -j = -j3\ \Omega$

$Z(3H) = 3(4)j = 12j\ \Omega$

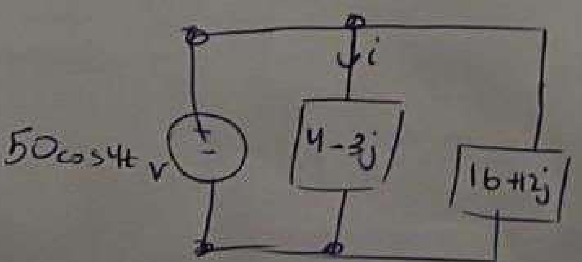


Q22	The impedance of the $\frac{1}{12}F$ is:		
a.	-j3 Ω	b.	j3 Ω
c.	$-j\frac{1}{48}\Omega$	d.	$j\frac{1}{48}\Omega$
e.	-j1.333 Ω	f.	j1.333 Ω

Q23	The impedance of the 3*H* is:		
a.	-j3 Ω	b.	j3 Ω
c.	-j12 Ω	d.	j12 Ω
e.	-j1.33 Ω	f.	j1.33 Ω

Q24	For the current waveforms *i(t)* through the 4 Ω resistor is:		
a.	$i(t) = 5\cos(4t)$ A	b.	$i(t) = 10\cos(4t + 36.8°)$ A
c.	$i(t) = 5\cos(4t - 90°)$ A	d.	$i(t) = 20\cos(4t + 45°)$ A
e.	$i(t) = 10\cos(4t - 36.8°)$ A	f.	$i(t) = 10\cos(4t + 45°)$ A

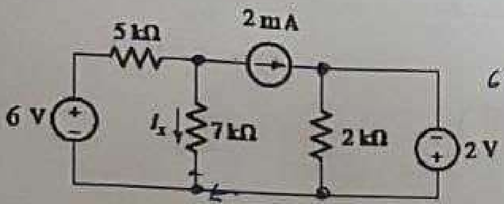
Q25	For the voltage waveforms across the inductor *v(t)* is:		
a.	$v(t) = 6\cos(4t + 15°)$ V	b.	$v(t) = 30\cos(4t - 53.1°)$ V
c.	$v(t) = 50\cos(4t + 90°)$ V	d.	$v(t) = 30\cos(4t + 53.1°)$ V
e.	$v(t) = 50\cos(4t - 90°)$ V	f.	$v(t) = 6\cos(4t + 15°)$ V

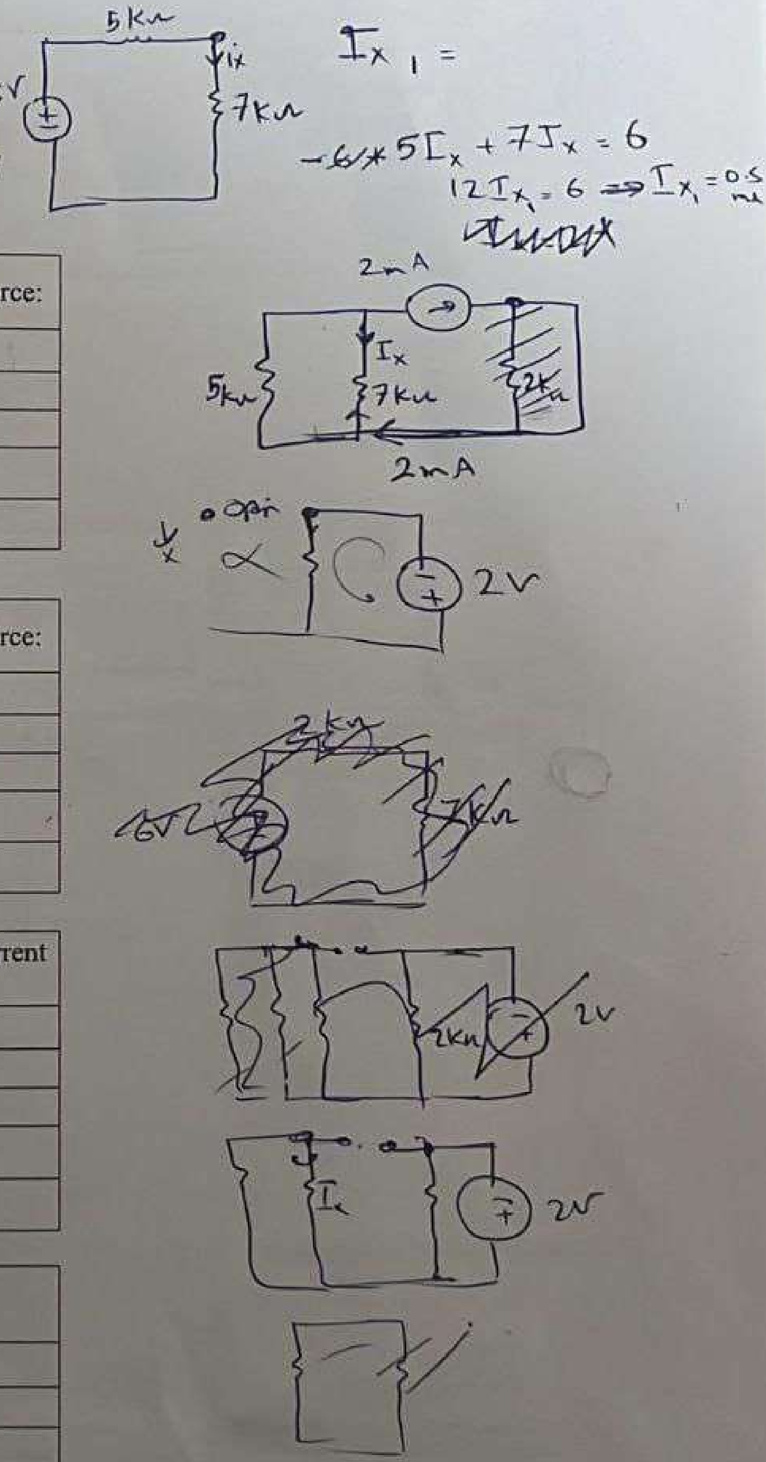


4

Best Wishes

For the circuit shown, use **Superposition principle to answer questions (12-15)



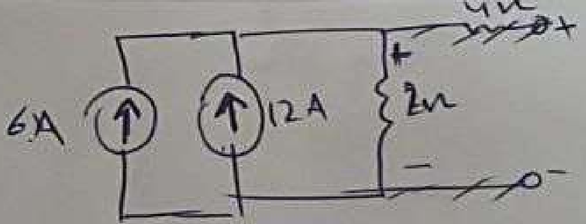


Q12	The current I_x due to the 2V voltage source:
a.	1 mA
b.	-1 mA
c.	-0.5 mA
d.	0 A
e.	0.5 mA

Q13	The current I_x due to the 6V voltage source:
a.	0.857 mA
b.	1.2 mA
c.	6 mA
d.	0 A
e.	0.5 mA

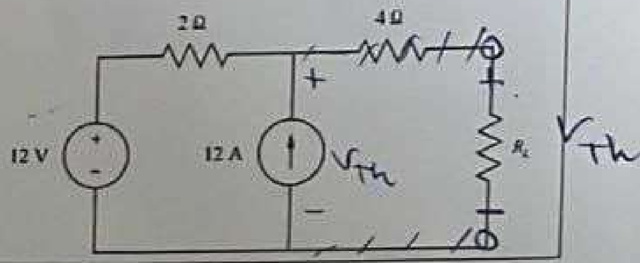
Q14	The current I_x due to the 2mA current source:
a.	-2 mA
b.	-0.286 mA
c.	0 A
d.	2 mA
e.	-0.83 mA

Q15	The current I_x in the given circuit:
a.	-0.33 mA
b.	1.33 mA
c.	-1.33 mA
d.	0 A
e.	0.33 mA

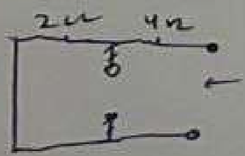


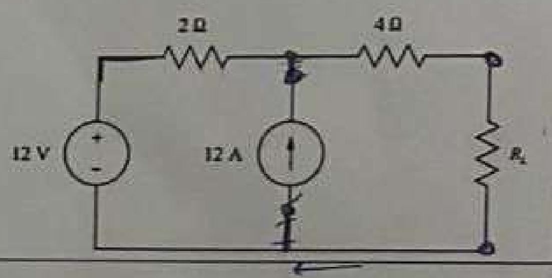
5

Q9	Thevenin equivalent voltage is:
a.	24 V
b.	-24 V
c.	36 V
d.	12 V
e.	-12 V



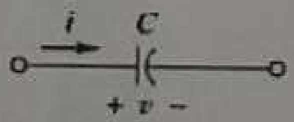
Q10	Thevenin equivalent resistance to the left of R_L is:
a.	0 Ω
b.	4 Ω
c.	2 Ω
d.	6 Ω
e.	1.33 Ω





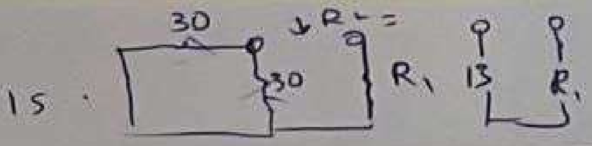
$i = C \frac{dv}{dt}$

Q11	If C=0.2F and $v(t) = e^{-2t}V$ in the following figure, then the current through the capacitor is:
a.	$i(t) = 5e^{-2t}\,A$
b.	$i(t) = -0.4e^{-2t}\,A$
c.	$i(t) = -0.1e^{-2t}\,A$
d.	$i(t) = e^{-2t}\,A$
e.	$i(t) = 0.2e^{-2t}\,A$



$i = (0.2) * e^{-2t} * -2$ $\qquad i = C\left(\frac{dv}{dt}\right)$

3

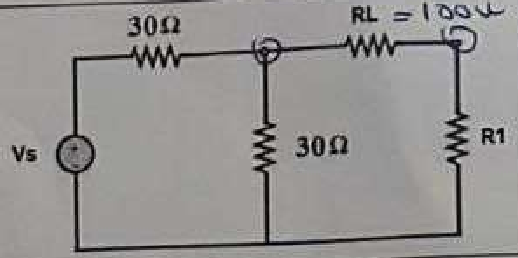


P = 1W

Q1	The maximum transferred power to the load R_L in the following circuit is 1 Watt. This occurs when R_L=100Ω. Based on the given information, the magnitude of the source voltage V_s is .....
a.	20 V
b.	10 V
c.	100 V
d.	40 V
e.	1 V

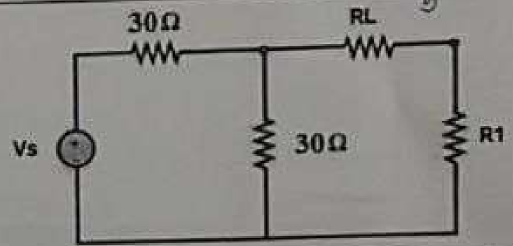
$\frac{1}{4}\left(\frac{V_{Th}^2}{100}\right) = 1 \times 100 \times 4$

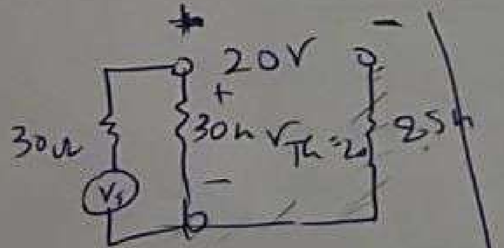
$V_{Th} = 20V$



$R_1 = 85\Omega$

Q2	The maximum transferred power to the load R_L in the following circuit is 1 Watt. This occurs when R_L=100Ω. Based on the given information, the magnitude of the R_1 is .....
a.	30 Ω
b.	60 Ω
c.	15 Ω
d.	85 Ω
e.	100 Ω

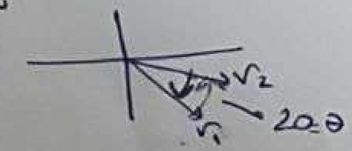




$20 = V_s \times \frac{30}{60}$

2

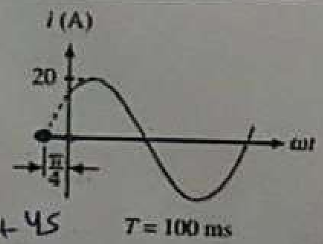
$v_1(t) = 20\cos(\omega t - 30^\circ) = 20 \angle -30^\circ$
$v_2(t) = 60\cos(\omega t - 10^\circ) = 60 \angle -10^\circ$



Q16	For the voltage waveforms $v_1(t) = 20\sin(\omega t + 60^\circ)$ V and $v_2(t) = 60\cos(\omega t - 10^\circ)$, the phase relation can be stated as ….		
a.	$v_1(t)$ leads $v_2(t)$ by 20°	b.	$v_1(t)$ leads $v_2(t)$ by 70°
c.	$v_1(t)$ lags $v_2(t)$ by 70°	d.	$v_1(t)$ lags $v_2(t)$ by 20°
e.	$v_1(t)$ lags $v_2(t)$ by 50°	f.	None of these

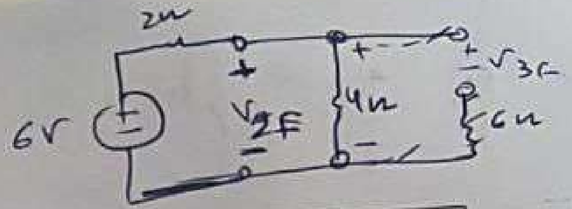
Q17	The sinusoidal waveform corresponding to a voltage phasor V = 60∠15° V, with angular frequency ω = 10 rad/s is given by ... 60 (10t + 15)		
a.	$v(t) = 60\sin(10t + 15^\circ)$ V	b.	$v(t) = 60\cos(10t + 15^\circ)$ V
c.	$v(t) = 60\sin(10t + -75^\circ)$ V	d.	$v(t) = 60\cos(10t - 75^\circ)$ V
e.	$v(t) = 60\cos(10t - 75^\circ)$ V	f.	None of these

Q18	For the sinusoidal current waveform shown below, the waveform can be expressed as...
a.	$i(t) = 20\sin(20\pi t - 45^\circ)$ A
b.	$i(t) = 20\sin(100t - 45^\circ)$ A
c.	$i(t) = 20\cos(20\pi t + 45^\circ)$ A
d.	$i(t) = 20\cos(100t - 45^\circ)$ A
e.	$i(t) = 20\sin(20\pi t + 45^\circ)$ A



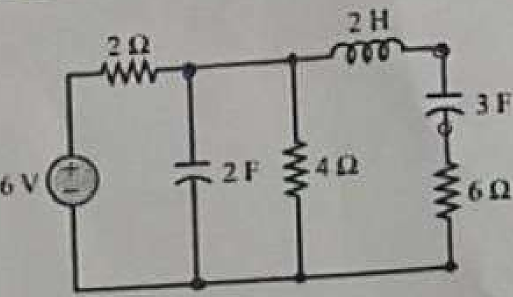
θ = +45

$\omega = \frac{2\pi}{100}$ (1000) = 20π rad/sec

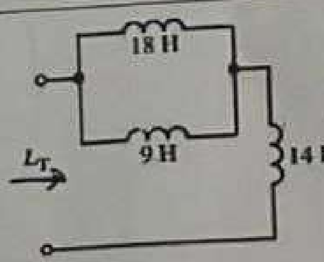


$\frac{1}{2}(c)v^2 =$

Q6	The energy stored in the 2 F Capacitor is …
a.	18 J
b.	24 J
(c.)	16 J
d.	0 J
e.	6 J



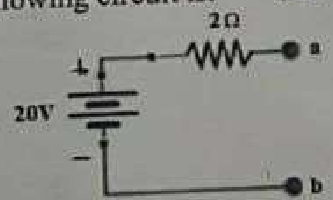
Q7	The equivalent inductance L_T is…
(a.)	20 H
b.	9.2 H
c.	41 H
d.	27 H
e.	0 H



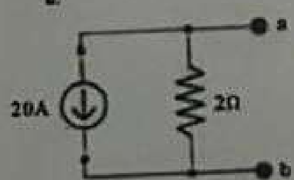
Q8. Norton equivalent circuit to the following circuit is:

$I_N = \frac{20}{2} = 10$ A

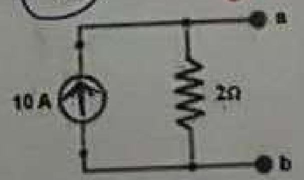
$R_N = 2Ω$



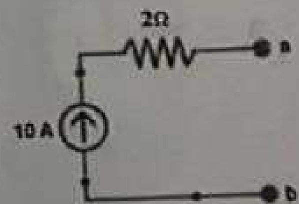
a.



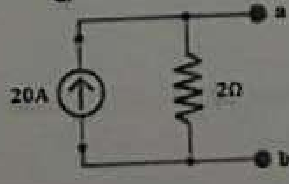
(b.)



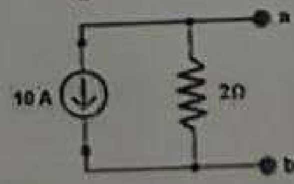
c.



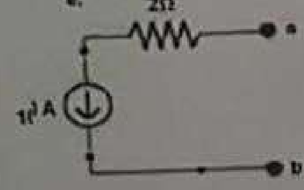
d.



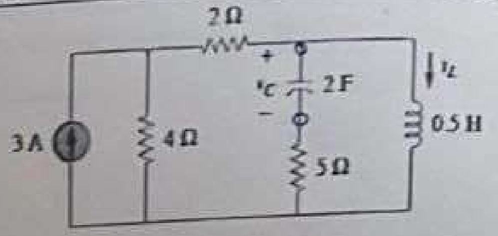
f.



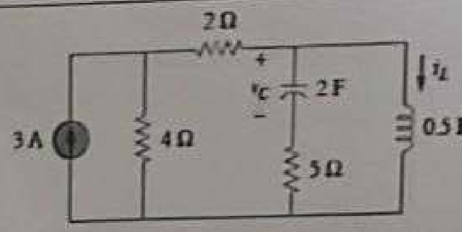
e.



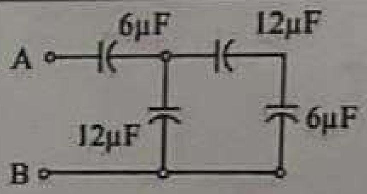
Q3	For the circuit shown below, the current through the inductor i_L is….
a.	3 A
b.	2 A
c.	0.5 A
d.	1 A
e.	0 A

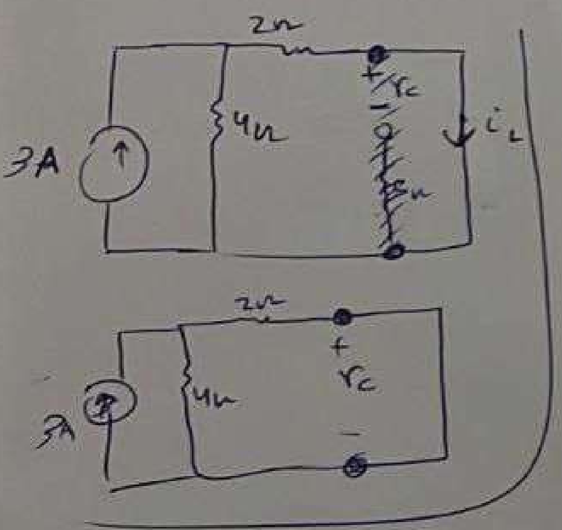


Q4	For the circuit shown below, the voltage across the capacitor v_c is ….
a.	6 V
b.	5 V
c.	30 V
d.	0 V
e.	12 V

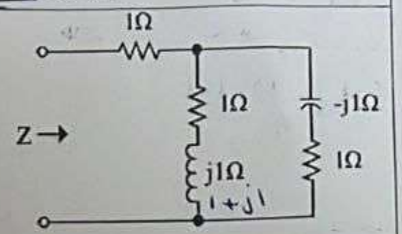


Q5	The equivalent capacitance seen between terminal A-B is…
a.	5 µF
b.	13.2 µF
c.	36 µF
d.	8.72 µF
e.	4.36 µF

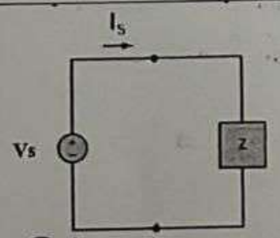




Q19	For the circuit shown below, the equivalent impedance Z is …
a.	1 Ω
b.	2 Ω
c.	3 Ω
d.	3 + j 2 Ω
e.	1.5 Ω



Q20	For the circuit shown below, if $v_s(t) = 10\cos(10t)$ and $i_s(t) = 5\sin(10t + 30^o)$, the elements of the impedance Z are …. and ….
a.	R=1Ω and C=0.173 F
b.	R=2Ω and C=0.173 F
c.	R=1Ω and L=1.73 H
d.	R=1Ω and C=1.73 F
e.	R=1Ω and L=0.173 H



Q21	The phasor diagram shown below shows the phasor relation between the voltage and current phasors V and I of ac circuit element. This is element is ….
a.	[illegible]
b.	combined (RC)
c.	pure inductor (L)
d.	pure capacitor (C)
e.	pure resistor (R)