Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

UG/PG DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL/MAY 2026

Second Semester

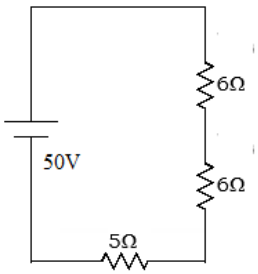
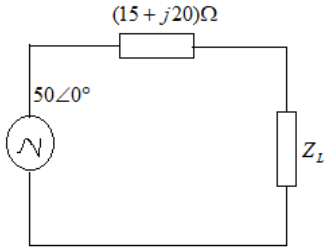
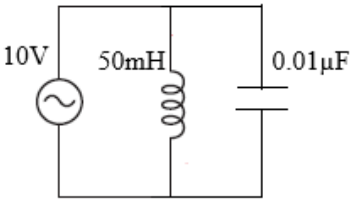
Electrical and Electronics Engineering

EE3251 / UEET24201 - ELECTRIC CIRCUIT ANALYSIS

Regulations – 2021 & 2024

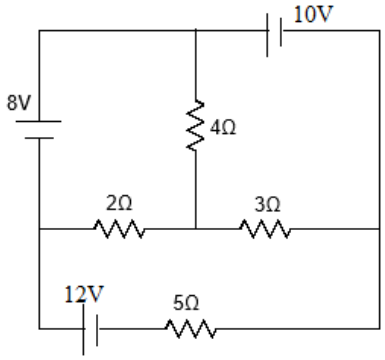
Duration : 3 Hrs *Maximum : 100 Marks*

*PART – A (ANSWER ALL QUESTIONS) (Marks 10*2=20)*

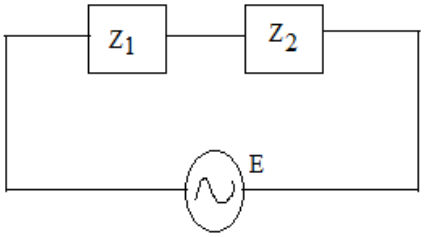
Q.No	*Questions*	*BLT*	*CO*	*Marks*
1.	Compute the voltage drop across the 3Ω resistor from the given circuit. 	L3	1	2
2.	Sketch the impedance triangle of a simple RC circuit having R=5Ω, C=10μF and V=10sin100πt.	L3	1	2
3.	State. Norton's theorem	L1	2	2
4.	Find the value of load impedance for which the source delivers maximum power. Also calculate the value of maximum power. 	L3	2	2
5.	Draw the equivalent circuit of a capacitor at $t = 0^+$ when i) there is no voltage at $t = 0^-$ ii) the capacitor is charged to V_0.	L2	3	2
6.	Given that $i(t) = \frac{E}{R} e^{-\frac{t}{RC}}$, Compute i(t) at one time constant.	L2	3	2
7.	Find the resonant frequency in the ideal parallel LC circuit. 	L3	4	2
8.	Mention the significance of dot convention in coupled circuits.	L1	4	2
9.	In a balanced delta connected system, identify the values of I_L and V_L in terms of I_{ph} and V_{ph}.	L1	5	2
10.	Distinguish between balanced and unbalanced networks.	L1	5	2

*PART – B (ANSWER ALL QUESTIONS) (Marks 5*16 = 80)*

Q.No			*Questions*	*BLT*	*CO*	*Marks*
11.	a	i	Determine the current through 5Ω resistor from the given circuit.	L3	1	8

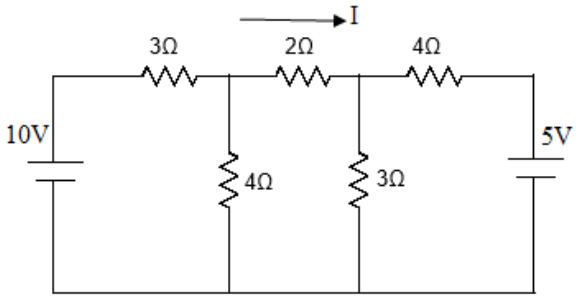


		ii	From the circuit shown, if $Z_1 = 5\angle 30°$, $Z_2 = 4\angle 60°$ and E=100V, calculate the current I and voltage drop across various impedances.	L3	1	8

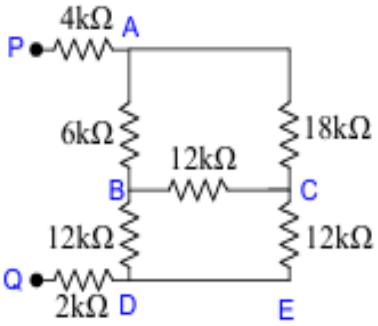


Or

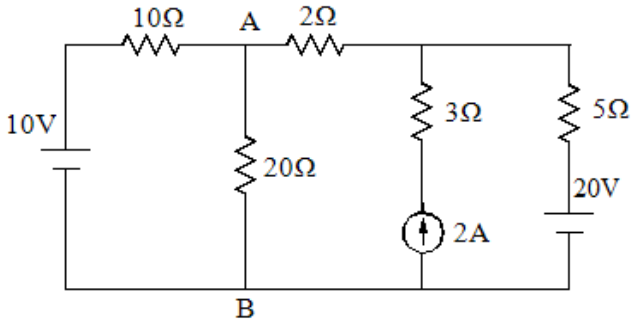
	b		Using mesh analysis, find the current I flows through the circuit.	L3	1	16



12.	a	i	Using star/delta transformation determine the resistance between A and B of the network shown.	L3	2	8

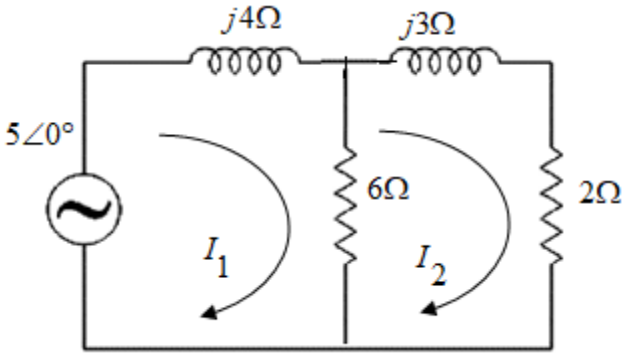


	ii	By using the superposition theorem, find the voltage across the 2Ω resistor from the given circuit.	L3	2	8

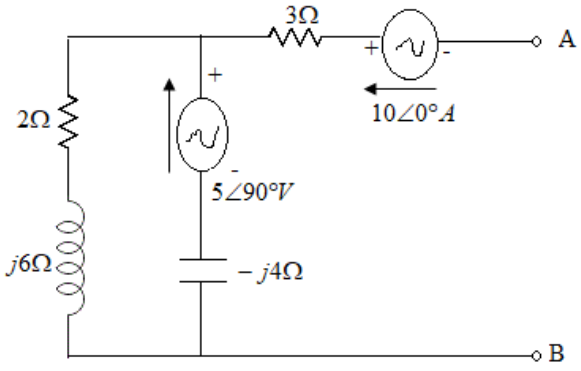


Or

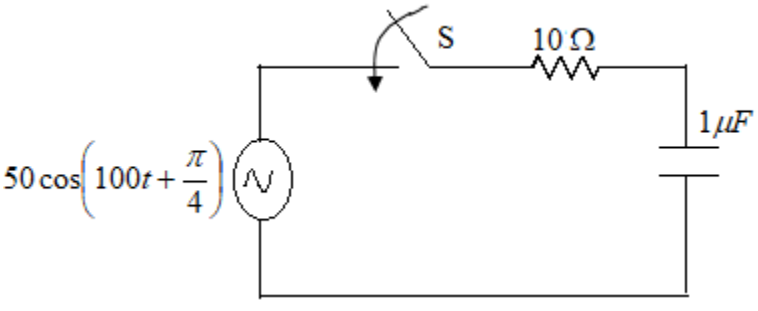
b	i	For the circuit given, determine the currents by using mesh current equations.	L3	2	8



	ii	For the given circuit, determine the Thevenin's equivalent between the terminals AB.	L3	2	8

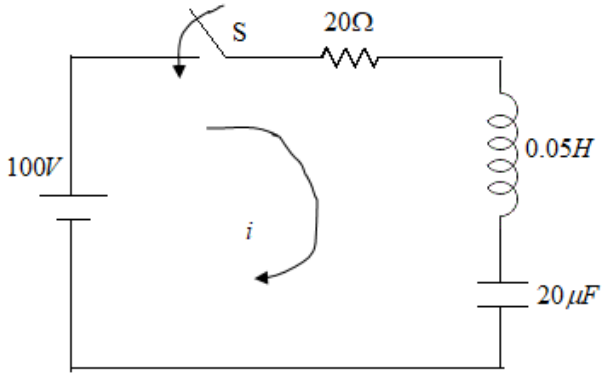


13.	a	For the given circuit, analyze for the complete solution of current when switch S is closed at t=0. Applied voltage $e = 50\cos\left(100t + \frac{\pi}{4}\right)$.	L4	3	16



Or

	b	For the given circuit, analyze the current transient when the switch is closed at t=0.	L4	3	16



14.	a i	Derive an expression for half power frequencies of series resonant circuit.	L2	4	8
	ii	A series RLC Circuit with R=10Ω, L=1mH and C=1μF has an applied voltage of 200V. Calculate i) resonant frequency ii) current at resonant frequency iii) impedance at 10Hz below resonant frequency.	L3	4	8
		Or			
	b i	Two identical coupled coils are connected in series has an equivalent inductance values of 0.084H and 0.0354H. Find L_1, L_2 and mutual inductance M.	L3	4	8
	ii	Derive the expression for coefficient of coupling between two coils.	L2	4	8
15.	a	A balanced three phase star connected load with impedance (8+j6)Ω per phase is connected across a symmetrical 400V, 3Φ, 50Hz supply. Determine the line currents and total power.	L3	5	16
		Or			
	b	Demonstrate the power measurement in three phase circuits. Also brief about power factor calculations.	L3	5	16