Register No : _____

THE KAVERY ENGINEERING COLLEGE

(An Autonomous Institution)

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

Third Semester

Biomedical Engineering

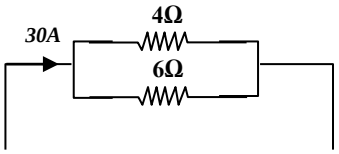
BM3352 – ELECTRIC CIRCUIT ANALYSIS

Regulations – 2021

Duration : 3 Hrs ***Maximum : 100 Marks***

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

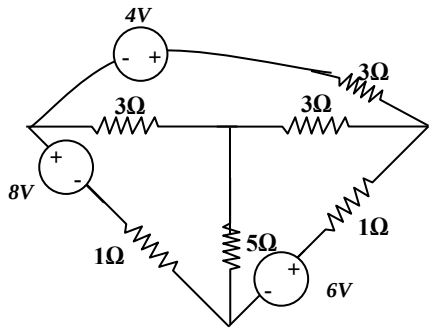
Q.No	Questions	BTL	CO	Marks
1.	An electric appliance consumes 1.2kWh in 30mins at 120V. what is current drawn by the appliance?	K1	1	2
2.	Distinguish between mesh and loop of a circuit.	K2	1	2
3.	Two resistors of 4Ω and 6Ω are connected in parallel. If the total current is 30A. find the current through each resistor shown in figure.	K2	2	2



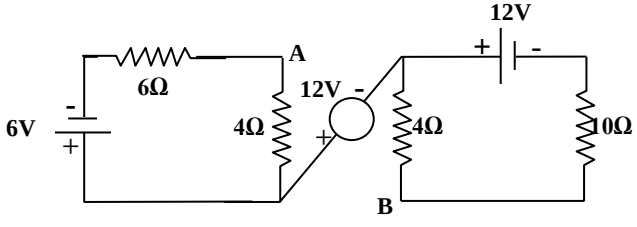
4.	Why do you short circuit the voltage source and open the current source when you find Thevenin's voltage of a Network?	K1	2	2
5.	State the relationship between angular frequency ω and frequency f.	K1	3	2
6.	Write the phasor current–voltage relation for an inductor	K1	3	2
7.	Distinguish between natural and forced response.	K2	4	2
8.	What is the time constant for RL and RC circuit?	K1	4	2
9.	What is co-efficient of coupling?	K1	5	2
10.	Determine the equivalent inductance of the circuit comprising two inductors in series opposing mode.	K2	5	2

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

Q.No			Questions	BLT	CO	Marks
11.	a	i	Determine the current IL in the circuit shown in figure.	K3	1	8

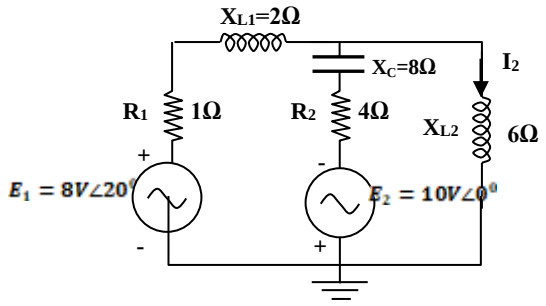


		ii	Calculate the voltage across A and B in the circuit shown in figure.	K3	1	8

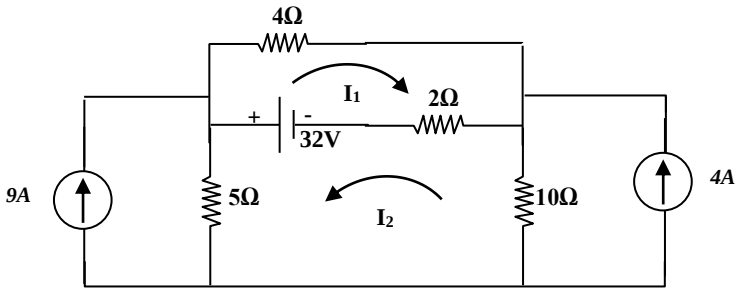


Or

	b	Using mesh analysis for the given figure, find the current I2 and drop across 1Ω resistor.	K3	1	16

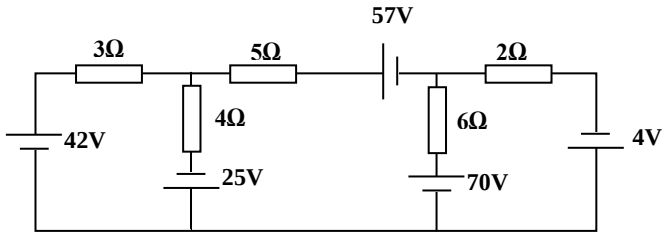


12.	a	Analyze the circuit using the superposition theorem to determine the current through the 5Ω resistor. Compare and verify the result by solving the circuit with an alternative method such as mesh or nodal analysis.	K4	2	16



Or

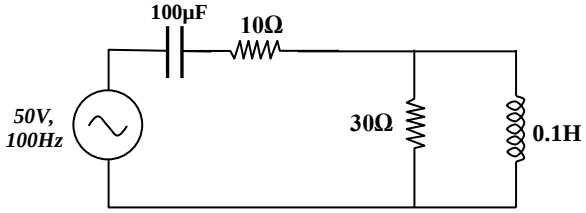
	b	Find the voltage across 5Ω resistor for the circuit shown in figure. Using source transformation technique and verify the results using mesh analysis.	K4	2	16



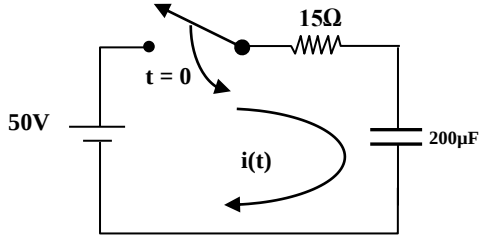
13.	a	A sinusoidal voltage source of V(t)=100cos(1000t) V is applied to a parallel RLC circuit with R=50 Ω, L=50 mH, and C=100 µF. Using admittance method, apply nodal analysis to calculate: (i) The total current supplied by the source, (ii) The branch currents in R, L, and C, (iii) The magnitude and phase angle of the total current, (iv) Draw the corresponding phasor diagram.	K3	3	16

Or

	b	i Three loads A, B, C are connected in parallel to a 240V source. Load A takes 9.6kW, load B takes 60A, and load C has a resistance of 4.8Ω. calculate RA and RB , and the total current, total power and equivalent resistance	K3	3	8
		ii For the circuit shown in figure, determine the total current and power factor.	K3	3	8

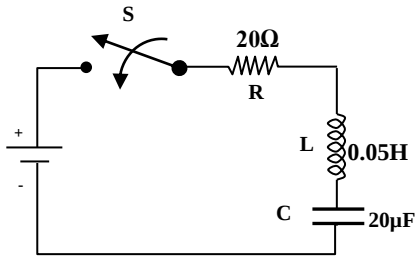


14.	a	In the circuit shown in figure. Determine the transient current after switch is closed at time t=0, given that initial charge of 100μC is stored in the capacitor. Derive the necessary equations.	K3	4	16



Or

	b	The circuit shown in figure, consists of resistance, inductance capacitance is series with 100V DC when the switch is closed at t=0. Find the current transient.	K3	4	16



15.	a	Explain the concept of mutual inductance and coupling coefficient in a transformer. Illustrate how they are related and describe their physical significance.	K2	5	16

Or

	b	Explain the process of forming a conductively coupled equivalent circuit for the given circuit. Describe qualitatively how the voltage drop across the 12Ω resistor can be determined.	K2	5	16