



CBCS SCHEME

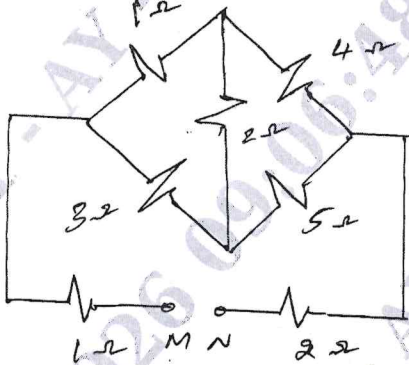
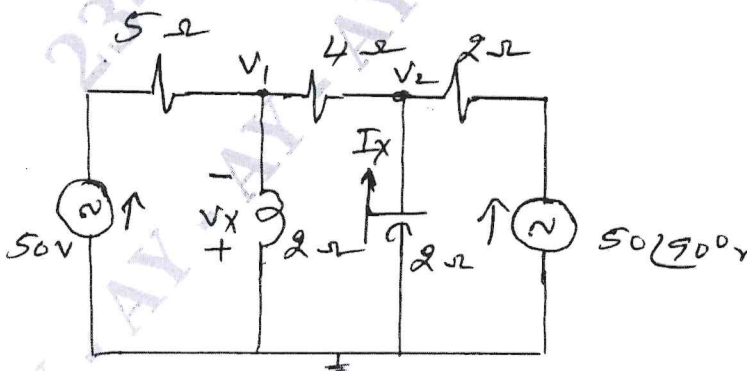
BEE302

Third Semester B.E./B.Tech. Degree Examination, June/July 2026 Electric Circuit Analysis

Time: 3 hrs.

Max. Marks: 100

Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

Module – 1			M	L	C
Q.1	a.	Define following : i) Linear and Bilateral network ii) Planner and Active network iii) Independent Energy Source.	5	L1	CO1
	b.	Solve for resistance between M and N using source transformation of the circuit shown in Fig.Q1(b). 	5	L3	CO1
	c.	Develop node equations of the network shown in Fig.Q1(c) and find V_X and I_X . 	10	L3	CO1

OR

Q.2	a.	Show how to convert Delta to star using Delta-star transformation.	4	L2	CO1
	b.	Solve for the potential difference between M and N using source transformation of the circuit shown in Fig.Q2(b).	4	L3	CO1
	c.	Apply Mesh current analysis to find the output of dependent current source shown in Fig.Q2(c).	8	L3	CO1
	d.	Develop the dual network of shown in Fig.Q2(d).	4	L3	CO1

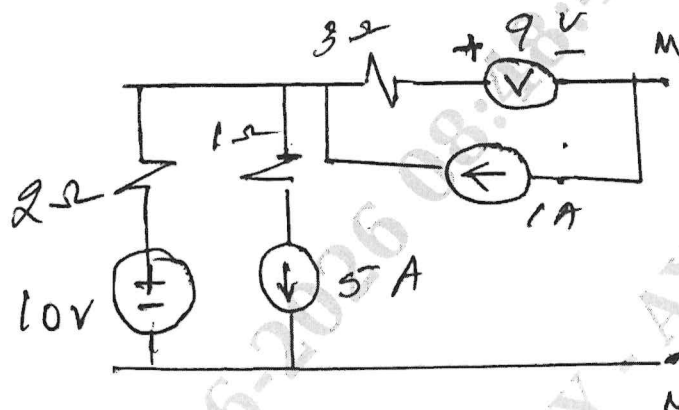


Fig.Q2(b)

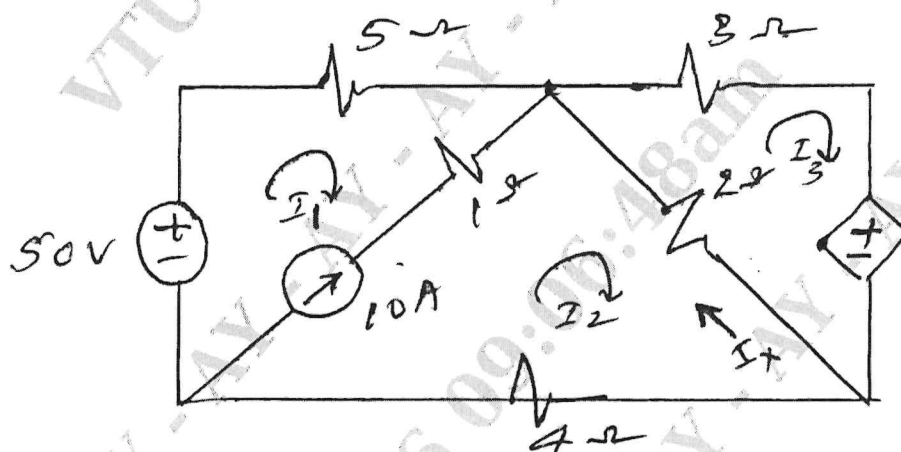


Fig.Q2(c)

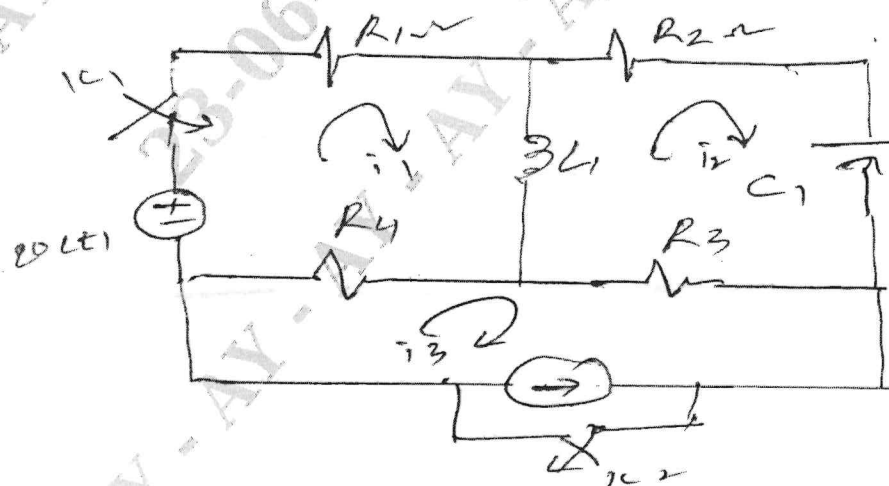


Fig.Q2(d)

Module – 2

Q.3 a. State and explain the super position theorem. 5 L2 CO2

b. Apply Norton's theorem, to find current in $3\ \Omega$ of the network shown in Fig.Q3(b). 7 L3 CO2

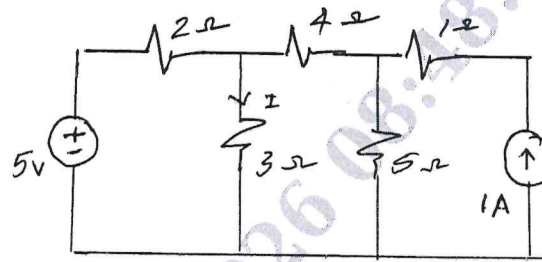


Fig.Q3(b)

c. For the network shown in Fig.Q3(c), obtain the condition for maximum power when load impedance consisting of variable resistance and reactance. Also, find maximum power. 8 L3 CO2

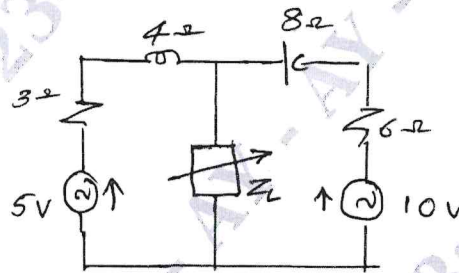


Fig.Q3(c)

OR

Q.4 a. State and explain Thevenin's theorem. 5 L2 CO2

b. Apply super position theorem, to find current in $(3 + j4)\ \Omega$ of the network shown in Fig.Q4(b). 8 L3 CO2

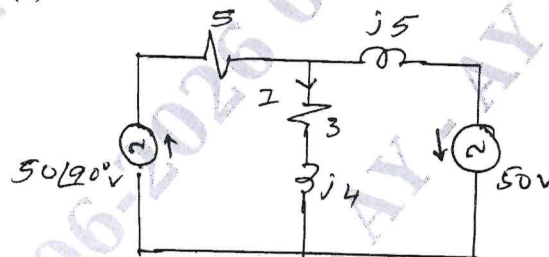


Fig.Q4(b)

c. For the network shown in Fig.Q4(c) obtain the condition for maximum power. Also, find the maximum power. 7 L3 CO2

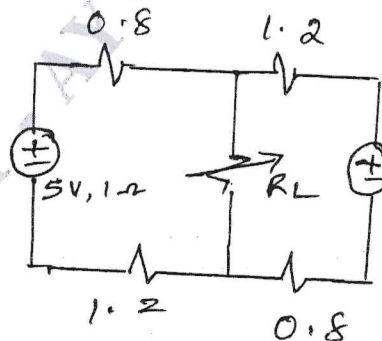
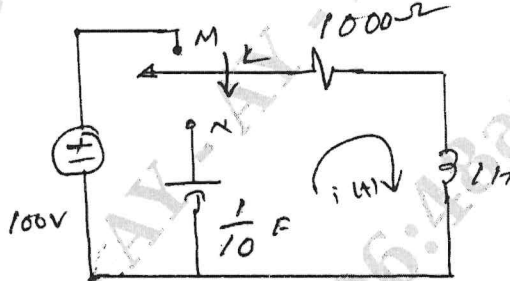
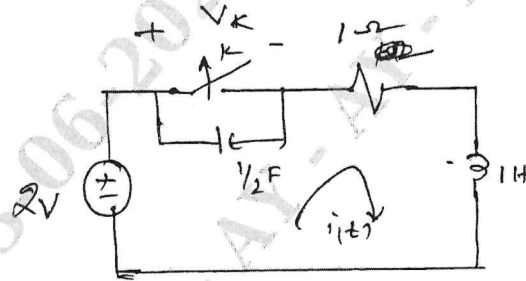
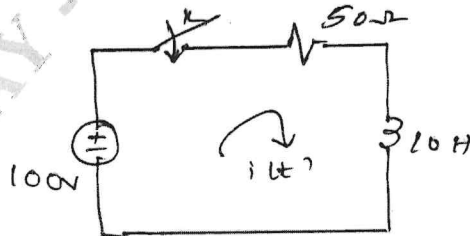


Fig.Q4(c)

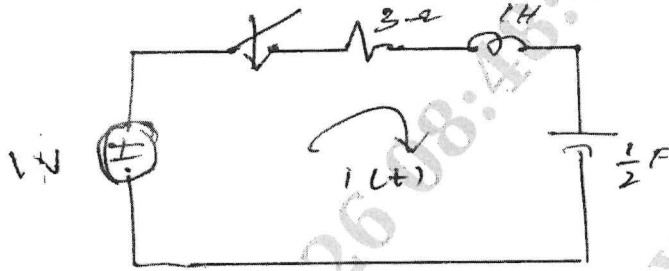
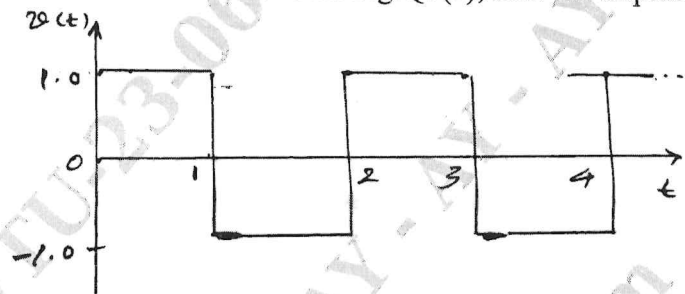
Module – 3

Q.5	a.	Show that the resonant frequency is geometric mean of cut off frequencies.	5	L2	CO3
	b.	A 50Ω resistance is connected in series with a inductor having a internal resistance and a capacitor which is supplied by 100 Volts and a variable frequency. At a frequency of 200 Hz, the current is maximum of 0.7A and voltage drop across the capacitor is 200V. Determine internal resistance, inductance capacitance of the network. Also find BW and Quality factor.	7	L3	CO3
	c.	A coil of 25Ω resistance has an inductance of 0.2H and is connected in parallel with capacitance of $100\ \mu\text{F}$. which is supplied by 100 V variable frequency. At resonance, determine resonant frequency, dynamic resistance bandwidth of Quality factor and current in each branch.	8	L3	CO3

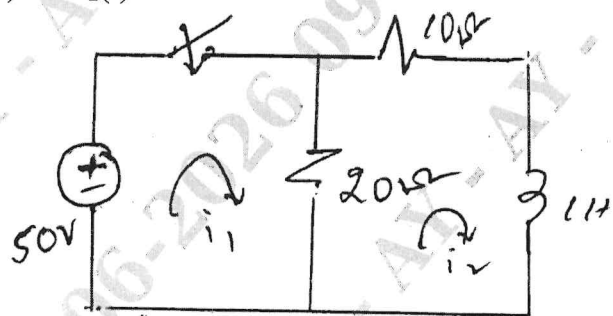
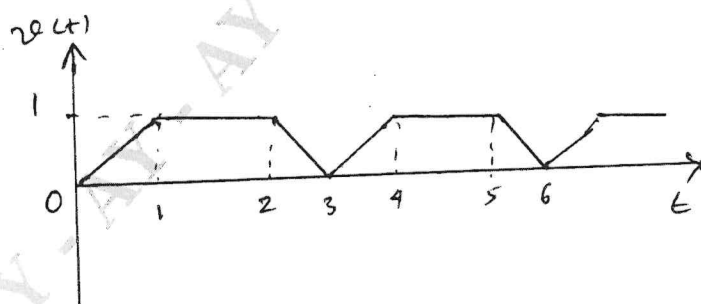
OR

Q.6	a.	For the network shown in Fig.Q6(a), switch is changed from M to N at $t = 0$, after having reached steady condition. Determine current $i(t)$ and its first and second derivation at $t = 0^+$.	7	L3	CO3
		 Fig.Q6(a)			
	b.	Solve for voltage drop across the switch $V_K(+)$ and its first and second derivation at $t = 0^+$. The switch K is opened at $t = 0$, after reaching the steady state condition of the network shown in Fig.Q6(b).	7	L3	CO3
		 Fig.Q6(b)			
	c.	Apply transient analysis of the network shown in Fig.Q6(c) to write the expression for current $i(t)$ for $t \geq 0$.	6	L3	CO3
		 Fig.Q6(c)			

Module – 4

Q.7	a.	State and prove Initial Value Theorem.	5	L2	CO4
	b.	For the network shown in Fig.Q7(b) obtain the expression for current $i(t)$ for $t \geq 0$.  Fig.Q7(b)	7	L3	CO4
	c.	For the periodic wave form shown in Fig.Q7(c), find the Laplace transform.  Fig.Q7(c)	8	L3	CO4

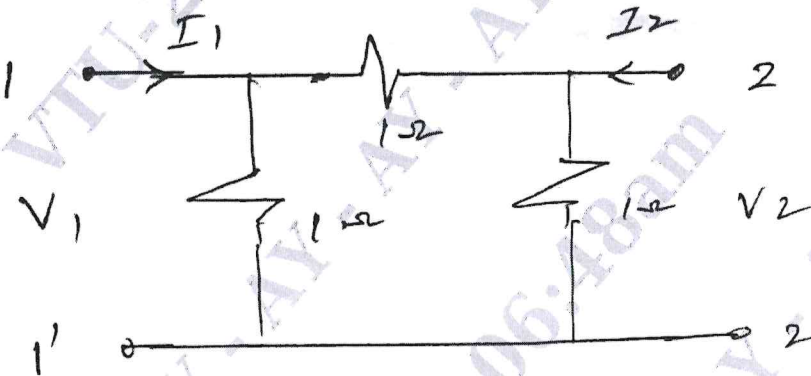
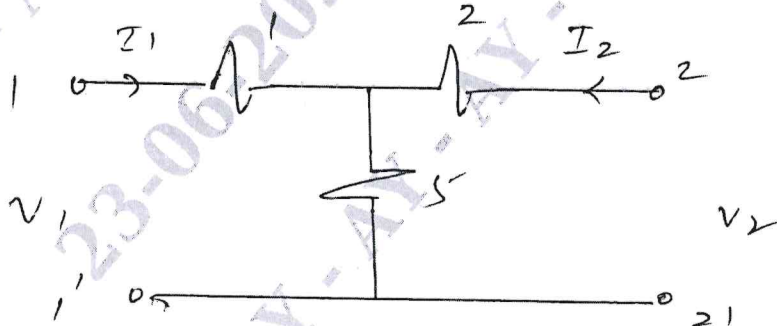
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Q.8	a.	State and Prove Final Value Theorem.	5	L2	CO4
	b.	For the network shown, draw the transformed network and find expression for current $i_1(t)$ and $i_2(t)$ for $t \geq 0$.  Fig.Q8(b)	7	L3	CO4
	c.	Determine the Laplace transform of periodic waveform shown in Fig.Q8(c).  Fig.Q8(c)	8	L3	CO4

Module – 5

Q.9	a. A 3-phase, 3-wire 240V, ACB system supplies a Delta connected load in which $Z_{AB} = 25\angle 90^\circ$, $Z_{BL} = 15\angle 30^\circ$, and $Z_{CA} = 20\Omega$. Find the line currents and total power.	10	L3	CO5
	b. Solve for line currents, neutral current and total power of 3-phase, 4 wire 208 volt, ABC system supplies star connected load. The load impedance are $Z_A = 10\Omega$, $Z_B = 15\angle 30^\circ$ and $Z_C = 10\angle -30^\circ\Omega$.	10	L3	CO5

OR

Q.10	a.	Explain Impedance and Admittance Parameters.	6	L2	CO5
	b.	Solve for admittance parameter for the network shown in Fig.Q10(b).	8	L3	CO5
 Fig.Q10(b)					
	c.	For the network shown in Fig.Q10(c), obtain the transmission parameter.	6	L3	CO5
 Fig.Q10(c)					
