CBCS SCHEME

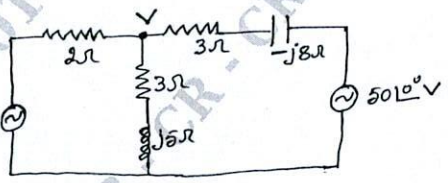
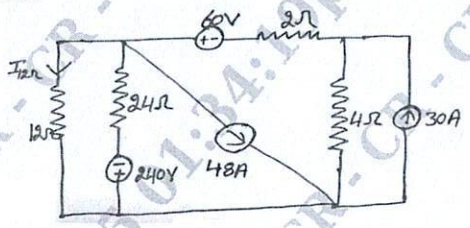
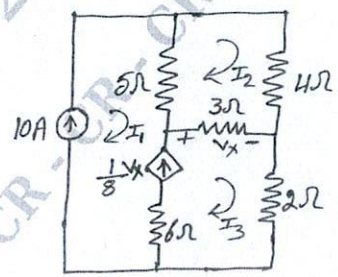
USN | | | | | | | | | | |

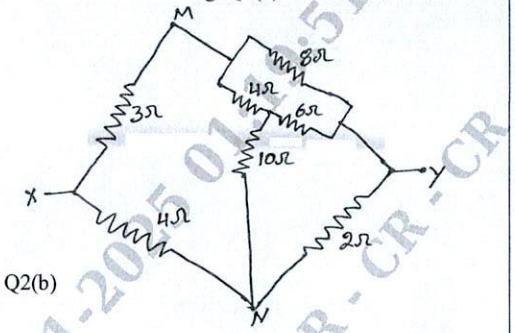
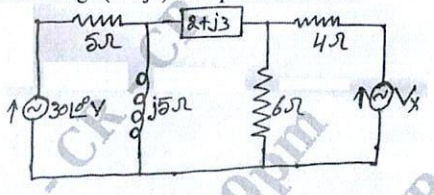
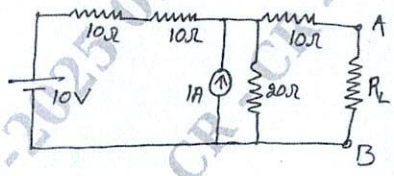
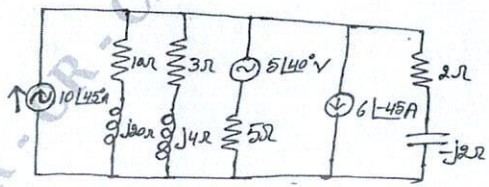
BEC304

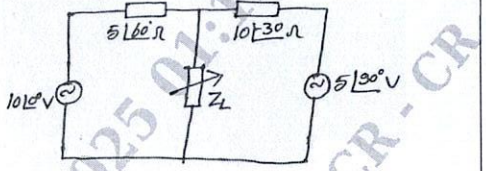
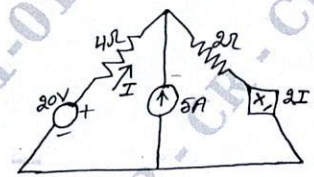
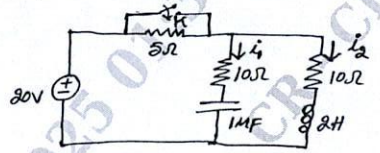
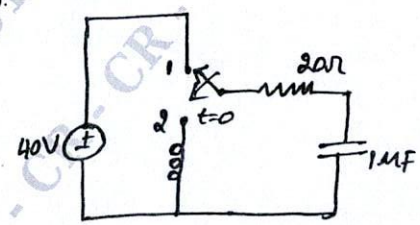
Third Semester B.E./B.Tech. Degree Examination, Dec.2024/Jan.2025
Network Analysis

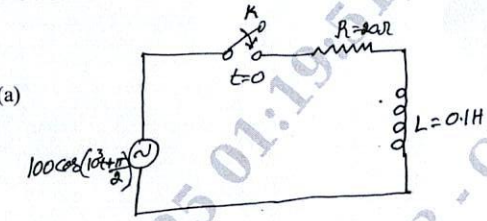
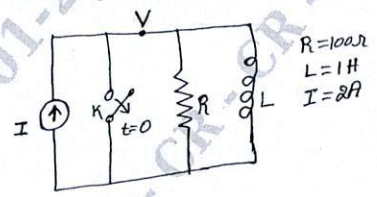
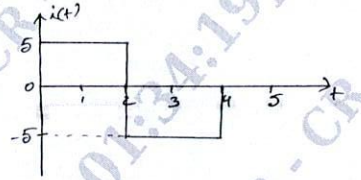
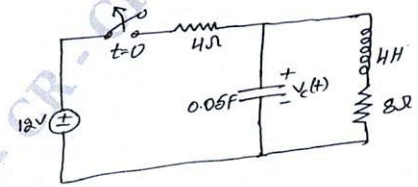
Time: 3 hrs. Max. Marks: 100

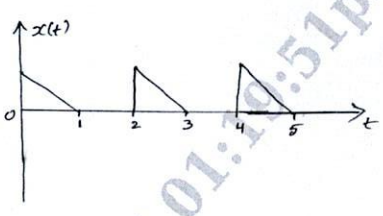
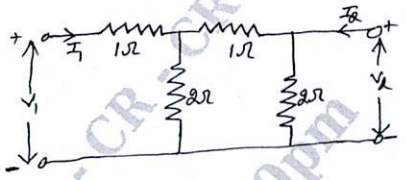
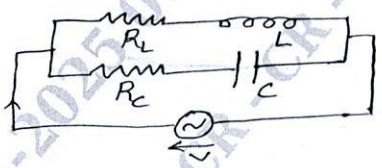
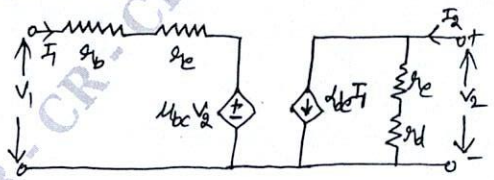
Note: 1. Answer any FIVE full questions, choosing ONE full question from each module.
2. M : Marks , L: Bloom's level , C: Course outcomes.

		Module – 1	M	L	C
Q.1	a.	Three impedances are connected in Delta. Obtain the star equivalent of the network.	7	L3	CO1
	b.	For the circuit shown in Fig. Q1(b). Find the voltage 'V' at node by using nodal analysis.  Fig. Q1(b)	6	L3	CO1
	c.	Determine the current in 12Ω resistor shown in Fig. Q1(c) using source transformation method.  Fig. Q1(c)	7	L3	CO1
		OR			
Q.2	a.	Find the loop currents I_1, I_2, and I_3 in the circuit shown in Fig. Q2(a).  Fig. Q2(a)	7	L3	CO1

	b.	Determine the resistance between the terminals X, Y using star delta transformation in the network shown in Fig. Q2(b).  Fig. Q2(b)	6	L3	CO1
	c.	Use the nodal analysis to find the value of V_X and the circuit shown in Fig. Q2(c). Such that the current through (2 + j3) Ω Impedance is zero.  Fig. Q2(c)	7	L3	CO1
		Module – 2			
Q.3	a.	Sate and prove Superposition theorem.	7	L2	CO2
	b.	For the circuit shown in Fig. Q3(b), obtain the Thevenin's equivalent circuit.  Fig. Q3(b)	7	L3	CO2
	c.	Using Millman's theorem, find current flowing through (3 + j4) Ω impedance for the circuit shown in Fig. Q3(c).  Fig. Q3(c)	6	L3	CO2
		OR			

Q.4	a.	State and prove Norton's theorem.	7	L2	CO2
	b.	Find the value of Z_L for Maximum Power transfer and the value of Maximum power for the circuit shown in Fig. Q4(b).  Fig. Q4(b)	6	L3	CO2
	c.	Find current 'I' using Super position theorem for the circuit shown in Fig. Q4(c).  Fig. Q4(c)	7	L3	CO2
		Module – 3			
Q.5	a.	Use the concepts of initial condition to illustrate the voltage behavior in inductor circuit for DC supply.	6	L3	CO3
	b.	In the circuit steady state is reached with switch 'K' open. The switch is closed at t = 0. Compute i , di/dt and d^2i/dt^2 at $t = 0^+$.  Fig. Q5(b)	7	L3	CO3
	c.	The switch is moved from position (1) to position (2) at t = 0. The steady state has been reached before switching. Computer i , di/dt and d^2i/dt^2 at $t = 0^+$ for Fig. Q5(c).  Fig. Q5(c)	7	L4	CO3
		OR			

Q.6	a.	In the circuit shown in Fig. Q6(a), determine complete solution for current when switch 'K' is closed at t = 0.  Fig. Q6(a)	10	L3	CO3
	b.	Compute v , dv/dt , d^2v/dt^2 at $t = 0^+$ for the circuit shown in below Fig. Q6(b), when the switch K is opened at t = 0.  Fig. Q6(b)	10	L4	CO3
		Module – 4			
Q.7	a.	Using waveform synthesis method to express the voltage pulse interms of unit step. Find i) L{i(t)} ii) L{∫ i(t).dt}.  Fig. Q7(a)	8	L3	CO4
	b.	State and prove initial value and final value theorem for Laplace transform.	6	L2	CO4
	c.	Obtain the Laplace transform of step and ramp function with relevant expressions.	6	L3	CO4
		OR			
Q.8	a.	Determine $i_L(t)$ for $t \geq 0$ using Laplace transform for circuit shown in Fig. Q8(a).  Fig. Q8(a)	10	L3	CO4

	b.	Find the Laplace transform of the periodic signal x(t) as shown in Fig. Q8(b).  Fig. Q8(b)	10	L3	CO4
		Module – 5			
Q.9	a.	Define Z – parameters. Determine Y parameters interms if Z – parameters.	6	L3	CO5
	b.	Show that resonant frequency is geometric mean of cut off frequency in series R – L – C circuit.	7	L3	CO5
	c.	Apply the two – port network analysis technique to determine ABCD – parameters of the network shown in Fig. Q9(c).  Fig. Q9(c)	7	L3	CO5
		OR			
Q.10	a.	Derive the expression for the resonant frequency of the circuit shown in Fig. Q10(a). Also show that the circuit resonate at all frequency if $R_L = R_C = \sqrt{\frac{L}{C}}$.  Fig. Q10(a)	10	L3	CO5
	b.	The model of a transistor in the CE mode is shown in Fig. Q10(b). Determine the h – parameters.  Fig. Q10(b)	10	L3	CO5

* * * * *

Current Session : 09:30:00

09:30:00 Session is in progress.

09:30:00 Session

Dashboard (dashboard.php) **Download Question Papers (downloadQP.php)**

Request Password (requestPass.php) Request Question Paper (qpRequest.php)

Discrepancy Tab (feedback.php)

G.M.R. INSTITUTE OF TECHNOLOGY KUNDAL HALLI

LOGOUT ! (logout.php)

Feedback/Remarks **Date:21-01-2025 | Session:09:30:00**

For Subject Code : BEC304

1. Q. 5) c) the value of the inductor to be taken as **1H (one henry)**