

CBCS SCHEME

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BEC304

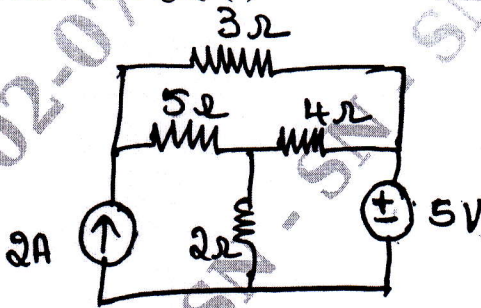
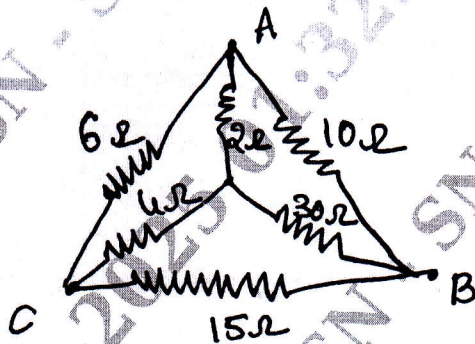
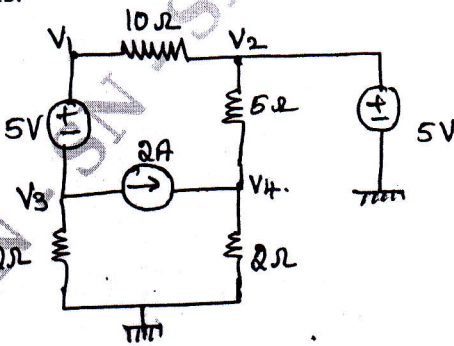
Third Semester B.E/B.Tech. Degree Examination, June/July 2025 Networks Analysis

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
1	a.	Using source transformation and source shifting techniques, find voltage across 2Ω resistor as shown in Fig.Q1(a).  Fig.Q1(a)	7	L3	CO1
	b.	For the circuit shown in Fig.Q1(b), determine the equivalent resistance between A and B.  Fig.Q1(b)	6	L3	CO1
	c.	For the network shown in Fig.Q1(c), compute all node voltages V_1, V_2, V_3 and V_4 using node analysis.  Fig.Q1(c)	7	L3	CO1

OR

- 2 a. Determine the equivalent resistance between terminal A and B, in the network shown in Fig.Q2(a). Using star to Delta transformation.

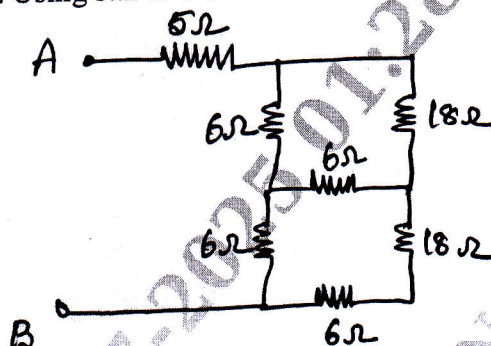


Fig.Q2(a)

- b. In the circuit shown in Fig.Q2(b), use the loop analysis to find the power delivered to the 4Ω resistor.

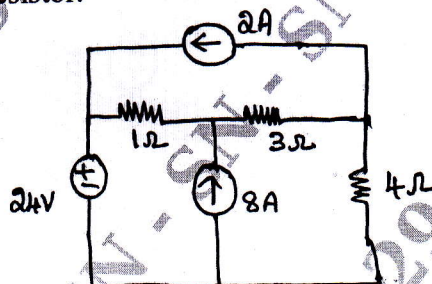


Fig.Q2(b)

- c. Using node voltage analysis, find the current in the each branch for the circuit shown in Fig.Q2(c).

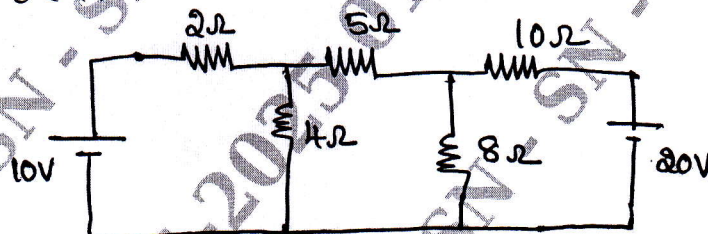


Fig.Q2(c)

Module - 2

- 3 a. State the explain Thevenin's theorem.

- b. Find I_0 in the network of Fig.Q3(b) below using Norton's theorem.

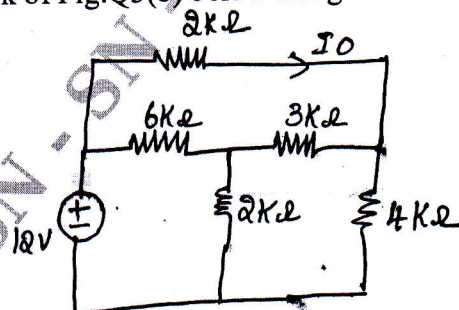


Fig.Q3(b)

OR

4	a.	State and explain maximum power transfer when load impedance consisting of variable resistance and variable reactance.	8	L2	CO2
	b.	Using Millman's theorem, find the current flowing through $R_L = 10\Omega$ of the circuit as shown in Fig.Q4(b).	12	L3	CO2

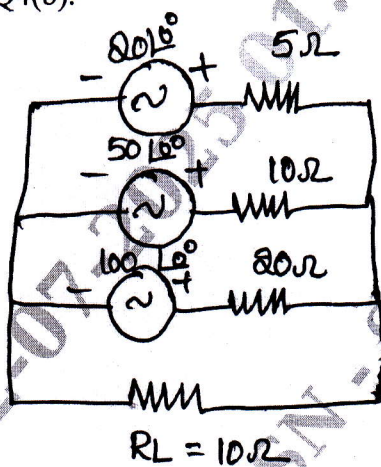


Fig.Q4(b)

Module - 3

5	a.	Explain the initial and final conditions in basic elements.	6	L2	CO3
	b.	Obtain the expression for transient response $i(t)$ of series R - C circuit when excited by DC supply.	6	L2	CO3
	c.	In the networks Fig.Q5(c), the switch K is opened at $t = 0$. At $t = 0^+$, solve for V , $\frac{dV}{dt}$ and $\frac{d^2V}{dt^2}$.	8	L3	CO3

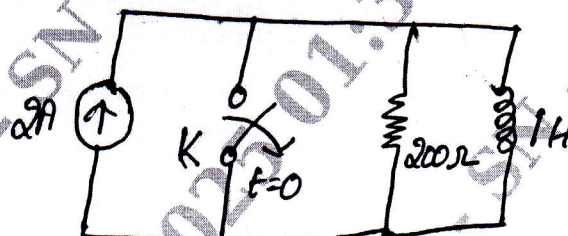


Fig.Q5(c)

OR

6	a.	Obtain the expression for transient response, $i(t)$ of series RL circuit when excited by AC supply.	6	L2	CO3
	b.	For the circuit shown in Fig.Q6(b), $V_C(0) = 0$. Find $i(0^+)$, $\frac{di}{dt}(0^+)$ and $\frac{d^2i}{dt^2}(0^+)$.	8	L3	CO3

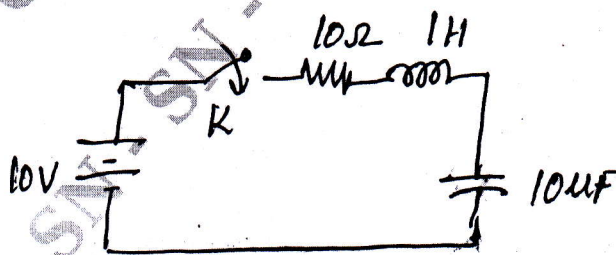


Fig.Q6(b)

	c.	Explain initial and final conditions in RLC parallel circuit and RLC series circuit.	6	L2	CO3
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Module – 4

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|---|----|---|----|----|-----|
| 7 | a. | State and prove initial and final value theorem. | 10 | L3 | CO3 |
| | b. | Find the Laplace transformer of the periodic signal $x(t)$ as shown in Fig.Q7(b). | 10 | L3 | CO3 |

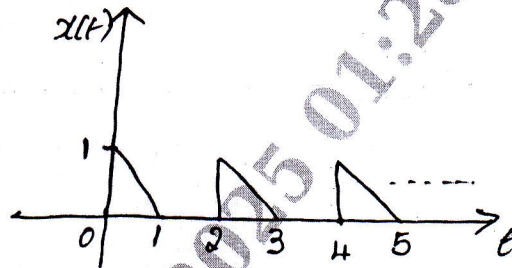


Fig.Q7(b)

OR

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|---|----|--|----|----|-----|
| 8 | a. | Find the Laplace transformer of $f(t)$ shown in Fig.Q8(a). | 10 | L3 | CO3 |
|---|----|--|----|----|-----|

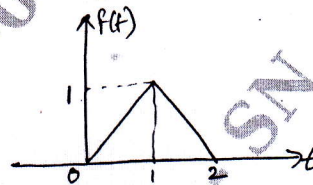


Fig.Q8(a)

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|--|----|--|----|----|-----|
| | b. | A voltage pulse of 10V and 2 sec duration is applied to the RC network shown in Fig.Q8(b). Find the current $i(t)$. | 10 | L3 | CO3 |
|--|----|--|----|----|-----|

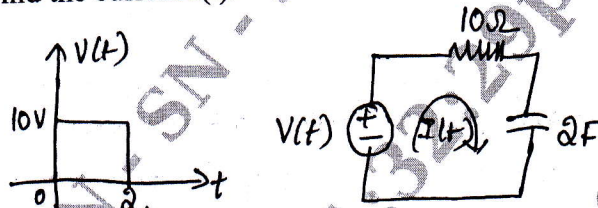


Fig.Q8(b)

Module – 5

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|---|----|---|---|----|-----|
| 9 | a. | Derive Y-parameters interms of Z-parameters. | 4 | L2 | CO4 |
| | b. | Determine h-parameters of the circuit shown in Fig.Q9(b). | 8 | L3 | CO4 |

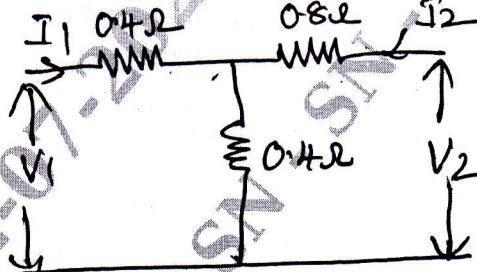


Fig.Q9(b)

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|--|----|--|---|----|-----|
| | c. | Prove the following expression in series resonance. $f_r = \sqrt{f_1 f_2}$. | 8 | L2 | CO4 |
|--|----|--|---|----|-----|

OR

- | | | | | | |
|----|----|--|---|----|-----|
| 10 | a. | Obtain an expression for resonance frequency in a parallel resonant circuit. | 4 | L2 | CO4 |
| | b. | Define ABCD parameters and obtain ABCD parameters interms of h-parameters. | 8 | L3 | CO4 |
| | c. | A series RLC circuit has $R = 50 \Omega$, $L = 0.2H$ and $C = 10 \mu F$ with an applied voltage of 20V. Determine : i) F_0 ii) Q_0 iii) BW. | 8 | L3 | CO4 |
