

THE KAVERY ENGINEERING COLLEGE
(An Autonomous Institution)

B.E/B.TECH DEGREE END SEMESTER THEORY EXAMINATIONS, APRIL-MAY 2025

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	BLT	CO	Marks
1.	Define Ohm's law.	L1	1	2
2.	Define Kirchhoff's voltage law.	L1	1	2
3.	What is the condition for maximum power transfer theorem?	L1	2	2
4.	Recall the voltage division rule.	L2	2	2
5.	Define apparent power.	L1	3	2
6.	Outline the characteristics of sinusoids.	L2	3	2
7.	Why does transient occur in electric circuits?	L1	4	2
8.	Draw the frequency response of RLC circuit.	L2	4	2
9.	What is meant by ideal transformer?	L1	5	2
10.	Show that number of links for a graph having n nodes and b branches is $b - n + 1$.	L2	5	2

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

Q.No	Questions	BLT	CO	Marks
11. a	Apply mesh analysis to determine the three mesh currents I_a , I_b , I_c shown in fig-1.	L3	1	16

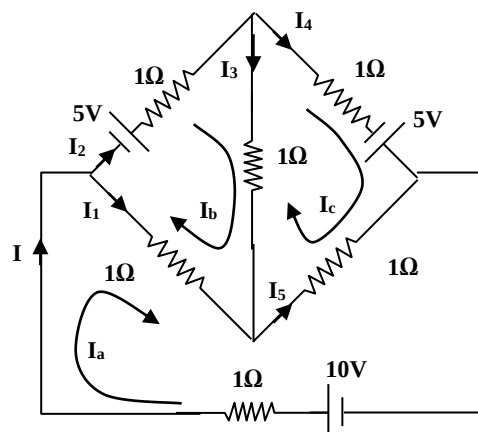


Fig 1

Or

- b Determine the voltage at each node for the circuit shown in fig-2. L3 1 16

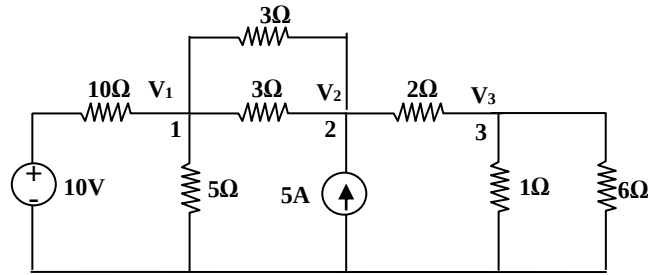


Fig 2

12. a Apply superposition principle, Find the current in the 2 Ω resistor in fig-3. L3 2 16

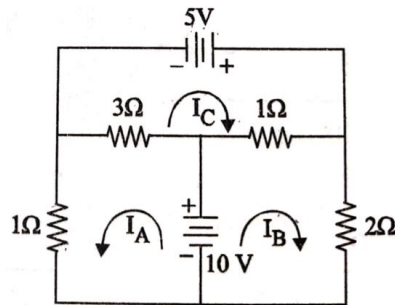


Fig 3

Or

- b Determine the current flowing through the 5Ω resistor in the fig-4 by using Thevenin's theorem. L3 2 16

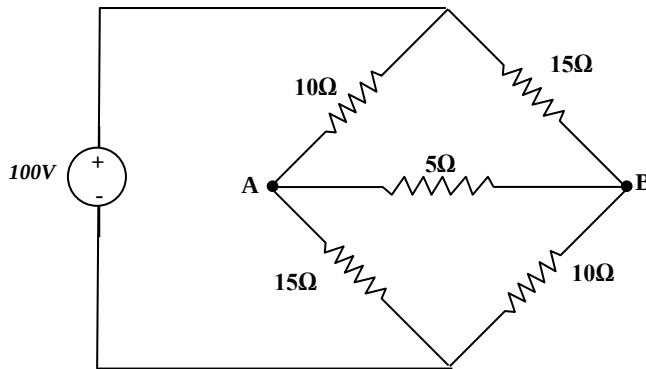


Fig 4

13. a Calculate the current I_o in the circuit of fig-5 using mesh analysis. L3 3 16

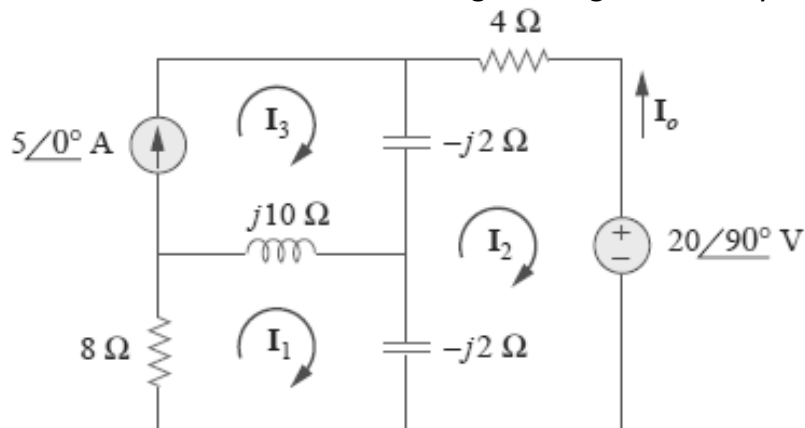


Fig 5

Or

- b Calculate the value of Z_{ab} in the network of fig-6.

L3 3 16

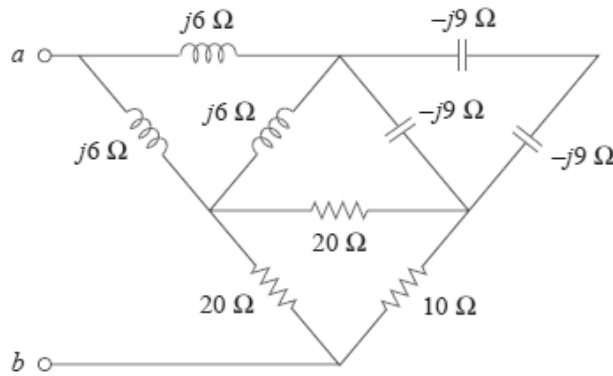


Fig 6

14. a In the RL circuit of fig-7 the switch is closed to position-1 at $t = 0$. Then at $t = 0.24$ second the switch is moved to position-2. Determine the response $i(t)$ and sketch the response. Also determine the time at which $i(t)$ is zero.

L3 4 16

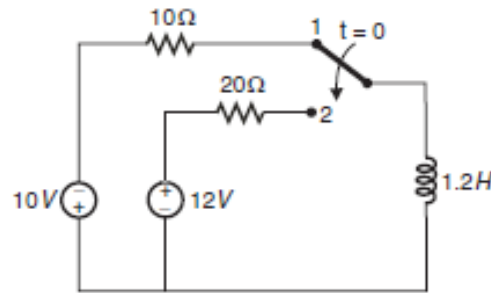


Fig 7

Or

- b i An RC series circuit with $R = 50 \Omega$ and $C = 20 \mu F$ is connected parallel to an inductance. The parallel combination is excited by a source of 10 V, 1 kHz. Determine the value of inductance if no reactive current is taken from the supply.
- ii An RLC series circuit is to be designed to produce a magnification of 5 at resonance. At higher cut-off frequency 1105 rad/s the impedance of the circuit is 21.2132Ω . Find the values of R, L and C.

L3 4 8

L3 4 8

15. a For the network shown in Fig 8 write the tie set matrix and determine the loop current.

L3 5 16

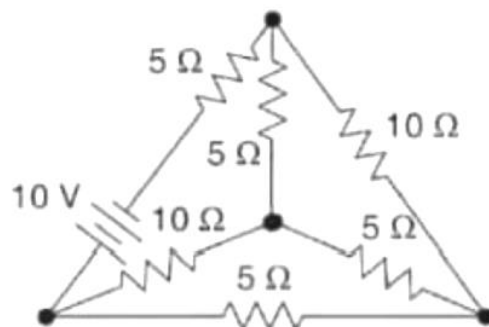


Fig 8

Or

- b Compute the mutual inductance with necessary equation and dot

L3 5 16

rule.