Course Code: 22EE2T02

BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE

(AUTONOMOUS)

I - B. Tech II-Semester Supplementary Examinations (BR23), Sep/Oct - 2024

NETWORK ANALYSIS (ECE)

Time: 3 hours | Max. Marks: 70

Question Paper consists of Part-A and Part-B
*Answer **ALL** the question in **Part-A and Part-B***

PART–A (10X2 = 20M)

		Marks	CO	BL
1. a)	State Thevenin's theorem	(2M)	CO1	L1
b)	Test the Inductance of a coil in which a current increases linearly from 0 to 0.2 mA in 0.3 sec, producing a voltage of 15 V.	(2M)	CO1	L4
c)	Compare the difference between Impedance and Resistance	(2M)	CO2	L4
d)	Define Quality factor	(2M)	CO2	L1
e)	Discuss transient state, transient time, natural response and forced responses	(2M)	CO3	L2
f)	Examine the Laplace transform of $e^{at}sinbt$	(2M)	CO3	L4
g)	Express the necessity of Dot convention in coupled circuits	(2M)	CO4	L2
h)	Generalize the Resonant frequency?	(2M)	CO4	L2
i)	Interpret open circuit impedance (Z) parameters of the 2 -port network	(2M)	CO5	L3
j)	Inspect the Inverse hybrid (G) parameters	(2M)	CO5	L4

PART–B (5X10 = 50M)

2.a)	For the circuit shown in **Fig. 1**, Test the voltage across the 10 Ω resistor and the current passing through it.	10(M)	CO1	L4

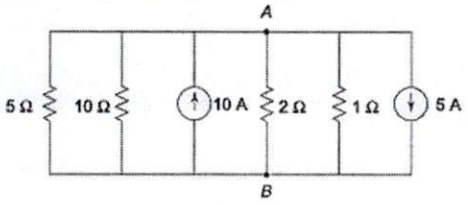

Fig. 1

(OR)

b)	Test the voltage across the 2 Ω resistor in **Fig. 2** by using the super-position theorem.	10(M)	CO1	L4

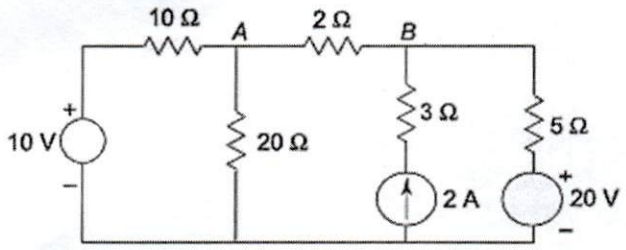

Fig. 2

3.a) Analyze the mesh current equations in the circuit shown in **Fig. 3**, and determine the currents. 10(M) CO2 L4

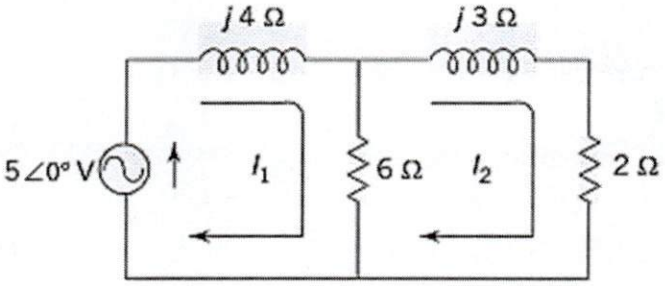

Fig. 3

OR)

b) For the circuit shown in **Fig. 4**, solve the impedance at resonant frequency, 10 Hz above resonant frequency, and 10 Hz below resonant frequency. 10(M) CO2 L3

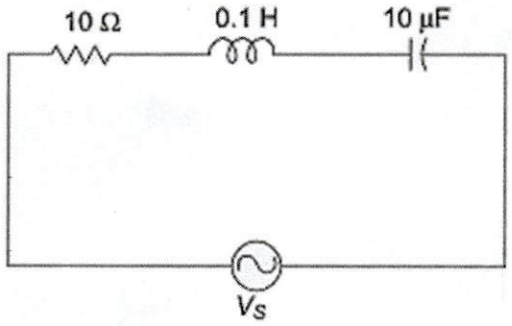

Fig. 4

4.a) For the circuit shown in **Fig. 5**, Identify the current equation when the switch S is opened at t = 0. 10(M) CO3 L2

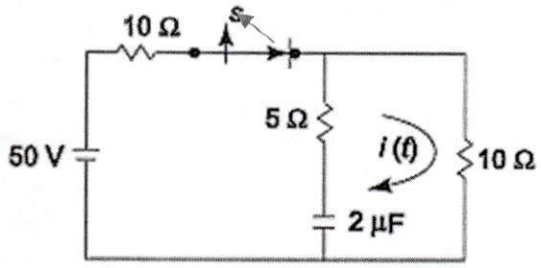

Fig. 5

(OR)

b) Interpret the Laplace transform of the function $f(t)=3t^4-2t^3+4e^{-3t}-2\sin 5t+3\cos 2t$ 10(M) CO3 L3

5.a) In the circuit shown in **Fig. 6**, calculate the total impedance, current I, phase angle q, and the voltage across each element. Solution To find impedance Z, we first solve for X_C and X_L 10(M) CO4 L4

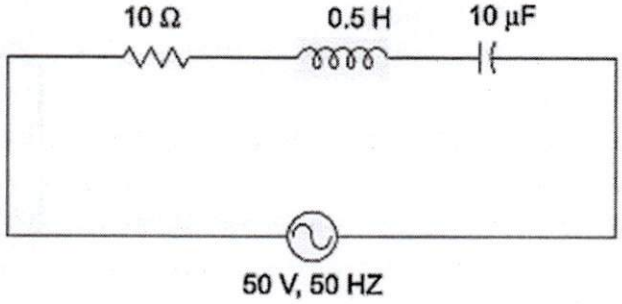

Fig. 6

(OR)

b) An ideal transformer has N1 = 10 turns, and N2 = 100 turns. What is the value of the impedance referred to as the primary, if a 1000 Ω resistor is placed across the secondary? 10(M) CO4 L4

6.a) Analyze the Z parameters for the circuit shown in **Fig. 7**. 10(M) CO5 L4

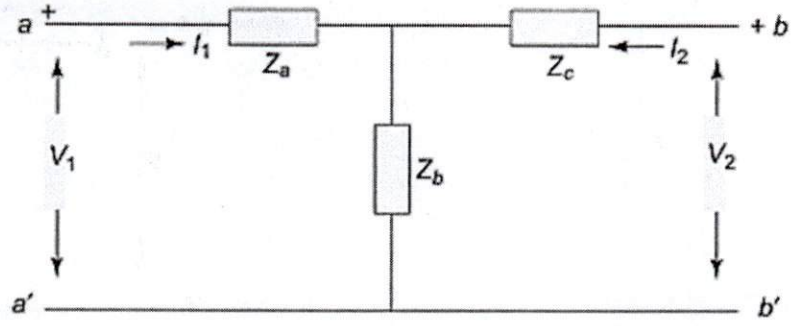

Fig. 7

(OR)

b) Explain the transmission or general circuit parameters for the circuit shown in **Fig. 8**. 10(M) CO5 L2

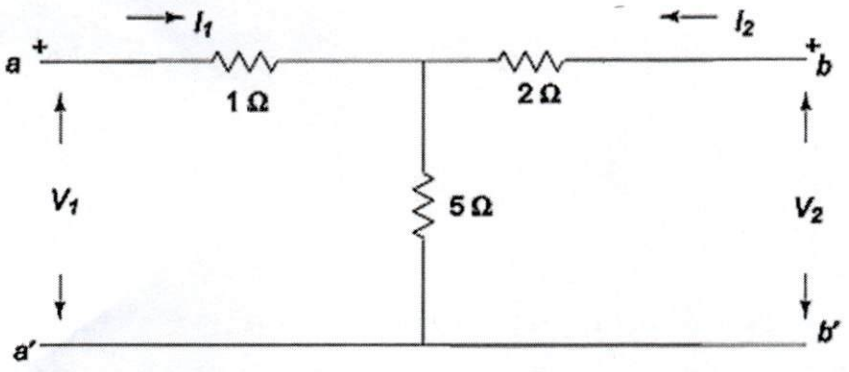

Fig. 8

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