Reg. No. ☐☐☐☐☐☐☐☐☐☐☐☐

B.E. / B.TECH. DEGREE EXAMINATIONS, MAY 2023
Second Semester
EC22202 – CIRCUIT THEORY
(ELECTRONICS AND COMMUNICATION ENGINEERING)
(Regulation 2022)

TIME: 2 HOURS   **MAX. MARKS: 60**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Apply suitable network theorems and analyze AC and DC circuits.	3
CO 2	Infer the phenomenon of series and parallel resonance in electrical circuits and understand the effect of magnetic coupling between windings	2
CO 3	Analyze the transient response for any RC, RL and RLC circuits.	4
CO 4	Evaluate the two port network parameters.	5
CO 5	Sketch the various network topologies.	4

PART- A (10 x 2 = 20 Marks)
(Answer all Questions)

|		CO	RBT LEVEL
1.	Identify the current flowing through R3 resistor in the below Circuit.	1	3
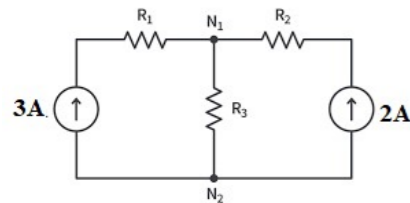
|			
2.	Construct a series RL circuit if the supply voltage is v(t) =10cos(2t+600)V, R= 2Ω and L=5H. Find current in the circuit?	1	3
3.	Infer the co efficient of coupling for the two coupled coils have a self-inductances 37.5 mH and 193 mH, with the mutual inductance of 63.75 mH.	2	2
4.	Construct an RLC series circuit has R=10ohm,L=2H.What value of capacitance will make the circuit critically damped?	3	3
5.	Outline the frequency response of a single tuned circuits.	3	2
6.	Summarize the significance of the ABCD parameters in interconnection of two-port networks?	4	2
7.	Make use of the two port network, Z11=100Ω, Z21=120Ω, Z12=120Ω, Z22=50Ω. Find Y parameters.	4	3
8.	Summarize the difference between a T-network and a π-network in two-port circuits?	4	2
9.	Develop link current and tie set matrix	5	3
10.	Summarize the basic mesh analysis procedure.	5	2

PART- B (3 x 10 = 30 Marks)

|		Marks	CO	RBT LEVEL
11. (a)	Analyze the Thevenin's equivalent for the circuit shown in Fig. with respect to terminals?	(10)	1	4
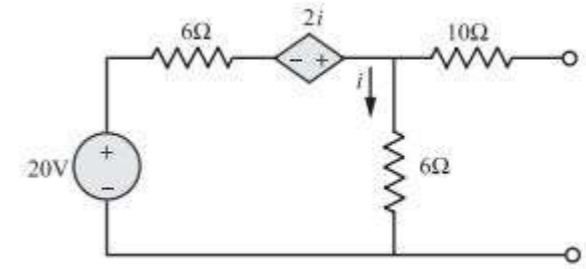
(OR)

(b)	Examine the current through 15ohm resistor using superposition theorem	(10)	1	4
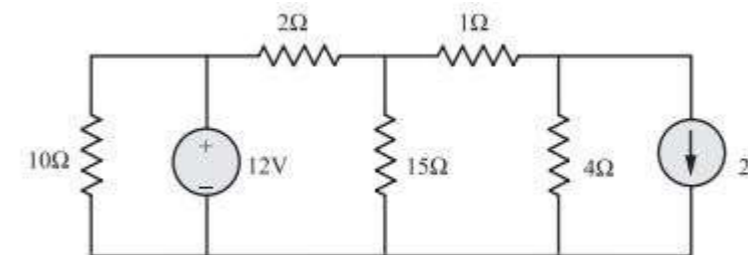
|				
12. (a)	Build a series RLC circuit with R=10Ω,L=10mH and C=1μF has an applied voltage of 200 V at resonance frequency .Calculate i)resonant frequency ii) current and voltage across the elements at resonance iii) Quality factor iv) Bandwidth of the circuit.	(10)	2	3
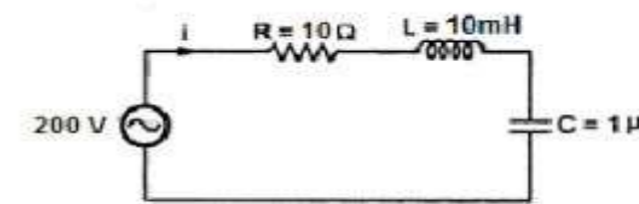
R=10Ω, L=10 mH, C=1μF, V=200V

(OR)

|				
(b)	Build the expression for coefficient of coupling in terms of mutual and self-inductances of the coils	(10)	2	3

13. (a) Decide the circuit's current i (t) at t > 0. The switch was in closed position **(10)** 3 5

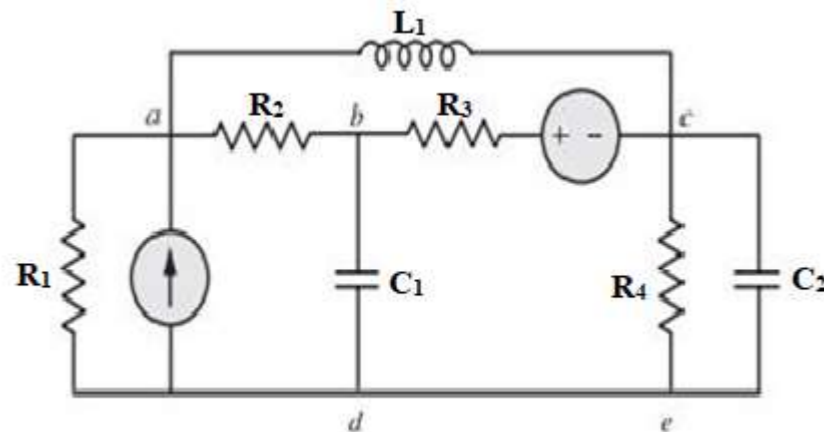for a long time. It is opened at time t = 0
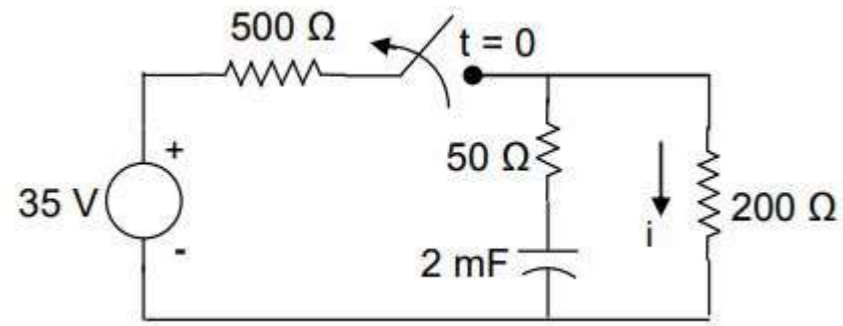
(OR)

(b) Evaluate the following parameters, when Initially relaxed series RL circuit **(10)** 3 5

with R = 100 Ω and L = 20 H has dc voltage of 200 V applied at time t = 0.

(a) the equation for current and voltages across different elements

(b) the current at time t = 0.5 s and 1.0 s

(c) the time at which the voltages across the resistor and inductor are equal.
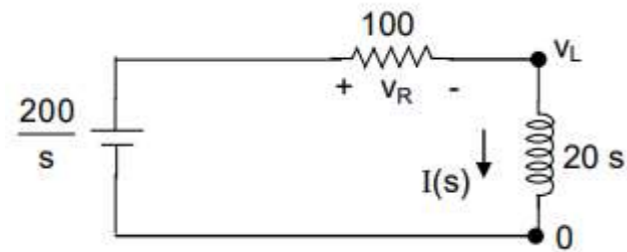
PART- C (1 x 10 = 10 Marks)
(Q.No.14 is compulsory)

	Marks	CO	RBT LEVEL

14. Make use of the circuit, draw the graph, one tree and its co-tree. **(10)** 5 3

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