Roll No. | | | | | | | | | | |

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. / B. Tech / B. Arch (Full Time) – ARREAR EXAMINATIONS, APRIL / MAY 2024

ELECTRONICS AND COMMUNICATION

Second Semester

EC5251 – CIRCUIT THEORY

(Regulation 2019)

Time: 3hrs **Max.Marks: 100**

CO 1	Ability to comprehend and design ac/dc circuits.
CO 2	Develop and understand ac/dc circuits.
CO 3	To be Capable of evaluating ac/dc circuits.
CO 4	To be able develop the capacity to analyze electrical circuits.
CO 5	To inherit the ability to apply circuit theorems in real time.

BL – Bloom's Taxonomy Levels

(L1 - Remembering, L2 - Understanding, L3 - Applying, L4 - Analysing, L5 - Evaluating, L6 - Creating)

PART- A (10 x 2 = 20 Marks)

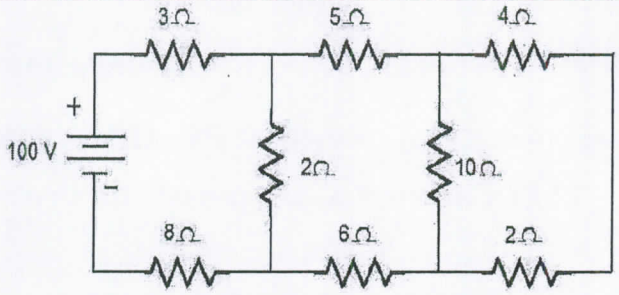
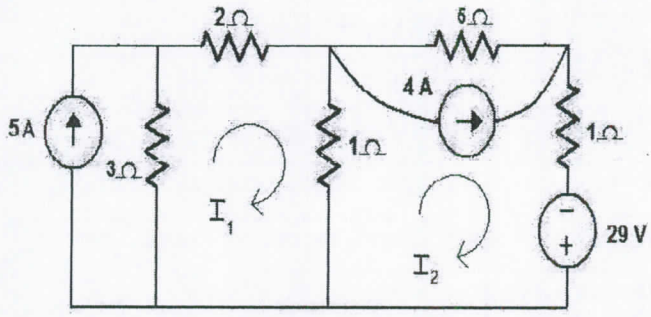
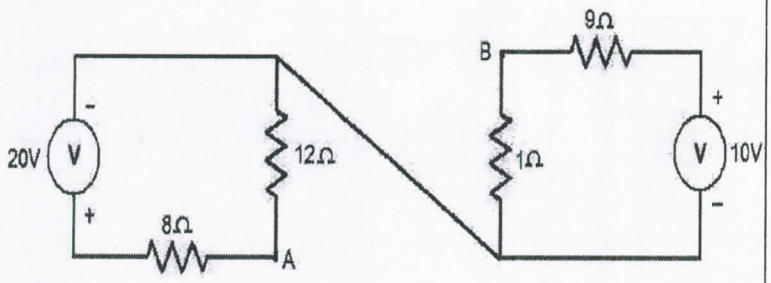
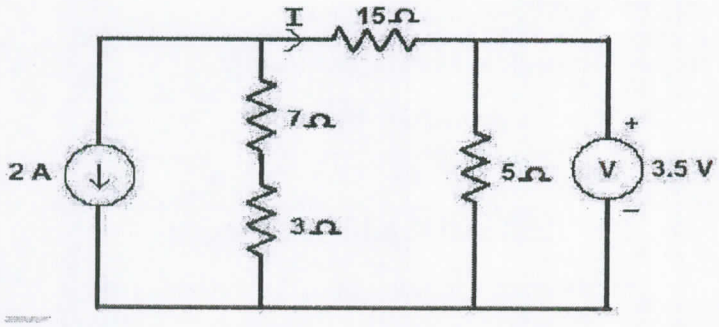
(Answer all Questions)

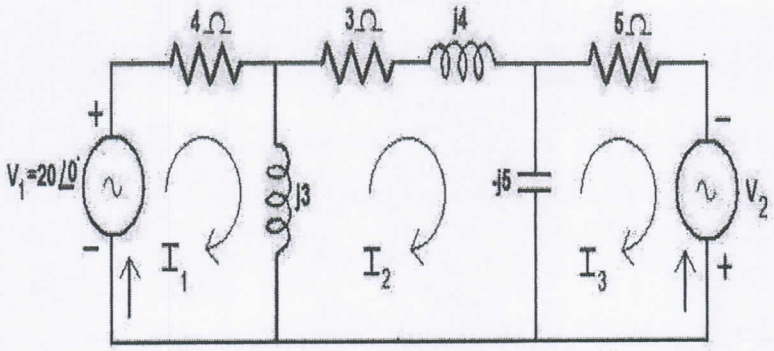
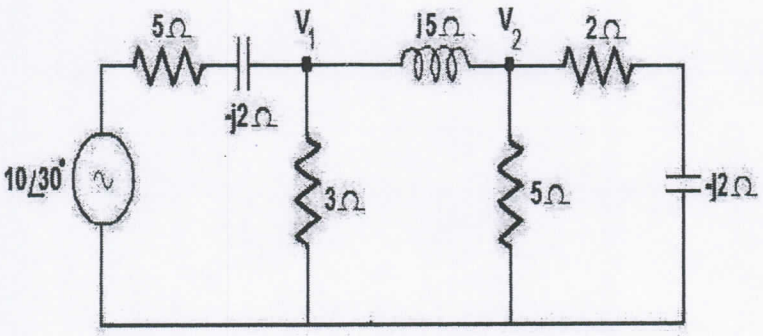
Q. No	Questions	Marks	CO	BL
1	Define Ohm's Law.	2	1	1
2	What is meant by Kirchoff's Voltage Law and Kirchoff's Current Law?	2	1	1
3	Write briefly about characteristics of the Series connection of Resistance.	2	2	2
4	State Reciprocity Theorem.	2	2	1
5	Define Selectivity.	2	3	2
6	Write down the applications of Maximum power transfer theorem.	2	3	2
7	Write the Characteristics of Parallel Resonance.	2	4	1
8	State the advantages of sinusoidal alternating quantity.	2	4	2
9	What is meant by Unilateral and Bilateral Element?	2	5	2
10	Define Mutual Inductance.	2	5	1

PART- B (5 x 13 = 65 Marks)

(Restrict to a maximum of 2 subdivisions)

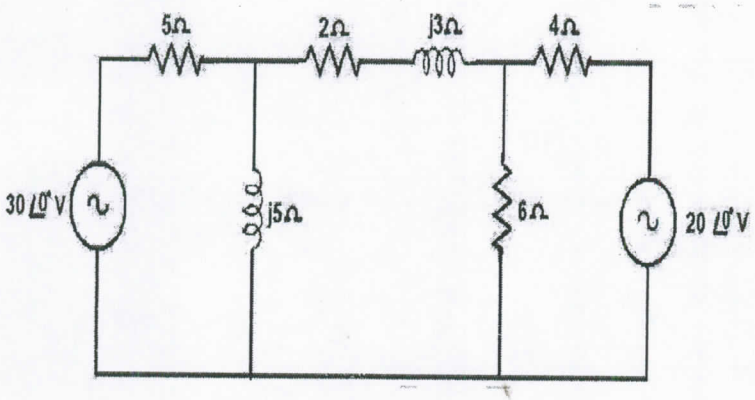
Q. No	Questions	Marks	CO	BL
11 (a)	Find the Current through each branch for the circuit given below by network reduction technique.	13	1	5

				
	OR			
11 (b)	Determine the mesh currents I_1 and I_2 for the given circuit shown below. 	**13**	**1**	**5**
12 (a)	Determine the Thevenin's Equivalent circuit across the terminals AB for the circuit shown in the below figure 	**13**	**2**	**3**
	OR			
12 (b) (i)	For the circuit shown below, use Superposition Theorem to evaluate the Value of I. 	**13**	**2**	**3**
13 (a) (i)	Determine the value of V_2 such that the current through the impedance (3+j4) ohm is zero.	**13**	**3**	**4**

				
	OR			
13 (b) (i)	Find the node voltages V_1 and V_2 and also the current supplied by the source for the circuit shown below. 	**13**	**3**	**4**
14 (a) (i)	Explain in detail with neat circuit diagram the Characteristics of the Series RLC Resonant Circuit and also derive the Resonant Frequency of the Same.	**13**	**4**	**3**
	OR			
14 (b) (i)	A series RLC circuit has R = 20Ω, L = 0.005H and C = 0.2×10^{-6}F. it is fed from a 100V variable frequency source. Find (i) frequency at which current is maximum, (ii) impedance at this frequency and (iii) voltage across inductance at this frequency.	**13**	**4**	**3**
15 (a) (i)	Explain in detail with neat illustration, the characteristics and the working principle of the Magnetic Coupled Circuits with relevant derivations. Also List out the advantages of the same.	**13**	**5**	**4**
	OR			
15 (b) (i)	Describe in detail, with neat illustrations, the construction and working principle of an Ideal Transformer. Also enumerate about the characteristics of the Ideal Transformer.	**13**	**5**	**3**

PART- C (1 x 15 = 15 Marks)

(Q.No.16 is compulsory)

Q. No	Questions	Marks	CO	BL
16.	Using the Superposition Theorem, Calculate the current through (2+j3)Ω impedance branch of the circuit shown below. 	15	3	4