Q. Code:812801

Reg. No. | | | | | | | | | | | | | |

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Second-Semester

EE18201-ELECTRIC CIRCUIT ANALYSIS

(Regulation 2018 / 2018 A)

TIME:3 HOURS **MAX. MARKS: 100**

CO 1 Analyze DC and single phase AC electrical circuits

CO 2 Simplify DC and AC electrical circuits using network theorems

CO 3 Study resonance phenomenon in electrical circuits and understand the effect of magnetic coupling between windings

CO 4 Perform transient analysis of electrical circuits and model circuits as two port networks

CO 5 Analyze three phase AC electrical circuits.

PART- A (10x2=20Marks)

(Answer all Questions)

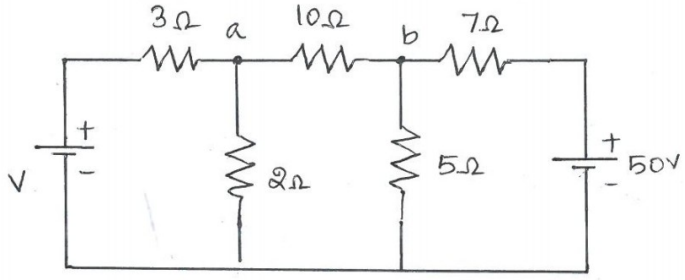
		Marks	CO	RBT LEVEL
1	What are the limitations of ohm's law?	**2**	**1**	**2**
2	A 20 Ω resistor is connected in series with an unknown resistor to a 200 V supply. If the current drawn is 4 A,find the value of the unknown resistor and power in each resistor.	**2**	**1**	**2**
3	State Super position theorem.	**2**	**2**	**1**
4	Write the condition to transfer maximum power from source to load in any AC circuit.	**2**	**2**	**2**
5	Two coils connected in series have an equivalent inductance of 0.4 H when connected in series aiding and an equivalent inductance of 0.2 H when connected in series opposition. Calculate the mutual inductance of coils.	**2**	**3**	**3**
6	Sketch the variation of current with frequency in a series RLC circuit and indicate the resonant point.	**2**	**3**	**2**
7	A DC voltage of 100 Volt is applied to a series RL circuit with R=25 Ω. What will be the current in the circuit at twice the time constant?	**2**	**4**	**2**
8	State the advantages of Laplace transform application to the solution of electric circuit.	**2**	**4**	**1**
9	A balanced star connected load of (3-4j) impedance is connected to 400V three	**2**	**5**	**2**

phase supply. What is the real power consumed by the load?

10	Explain how the power factor of a balanced three phase load can be determined by two-watt meter method.	**2**	**5**	**2**

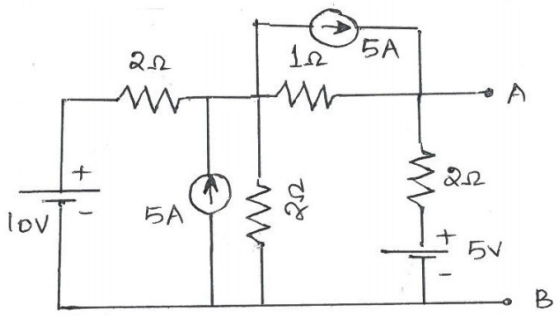
PART- B (5x 14=70Marks)

		Marks	CO	RBT LEVEL
11(a)	Find the supply voltage V in the circuit shown in Fig. which drives a current zero in the 10Ω resistor employing nodal analysis.	**14**	**1**	**4**



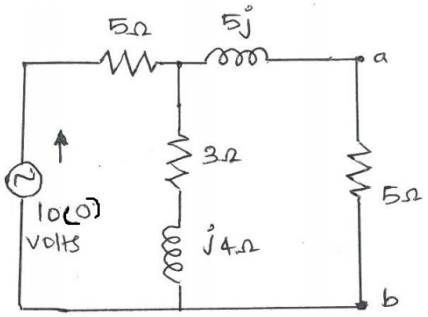
(OR)

(b)	Two impedance Z_1= (15-j13.1) Ω and Z_2 = (18.57+j 16.42) Ω are Connected in parallel across a voltage of (100+j200) volts. Estimate (i) Branch currents (ii) Total power consumed.	**14**	**1**	**4**
12(a)	Predict the Thevenin's equivalent circuit across the terminals AB. circuit.	**14**	**2**	**4**

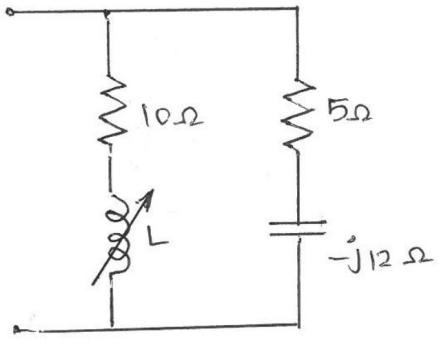


(OR)

(b)	Find the current through branch a-b of the network shown below using Norton's theorem.	**14**	**2**	**4**



13(a)	Find the value of L at which the circuit resonates at a frequency of 1000rad/sec in the circuit in fig.	**14**	**3**	**4**

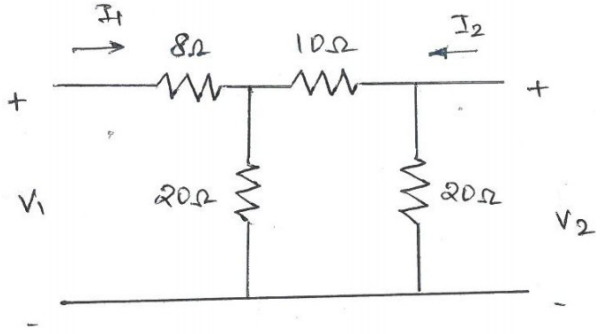


(OR)

(b)	Elucidate the dot convention procedure to obtain the mutual inductance with relevant circuit diagrams.	**14**	**3**	**4**
14 (a)	Discuss in detail the transient response of series RC circuit with sinusoidal excitation. Derive the steady state current for the same.	**14**	**4**	**4**

(OR)

(b)	Determine the impedance parameter and draw the T-equivalent circuit for the given two port network in Fig.Also derive the transmission line(ABCD) parameters from Z parameter.	**14**	**4**	**4**



15(a)	A delta connected balanced load is supplied from a 3 phase 400V supply. The	**14**	**5**	**4**

line current is 20A, total power taken by load is 10,000W.Calculate the impedance in each branch, the line current, power factor and total power consumed if the same load is connected in star.

(OR)

(b)	Explain the measurement of power and power factor of a balanced and unbalanced load in a three phase system.	**14**	**5**	**4**

PART- C (1x 10=10Marks)

		Marks	CO	RBT LEVEL
16	A current $5 \angle 30^\circ$ A is flowing through a circuit consists of series connected when excited by a source of $200 \angle 0$ V, 50Hz. Analysis the elements of circuit and power. Also draw the phasor diagram.	**10**	**1**	**4**

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