CENTRAL POLYTECHNIC COLLEGE, THARAMANI-600 113.

(An Autonomous Institution)

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGG.

QUESTION BANK

EEE31020 – ELECTRIC CIRCUIT THEORY

U.N	Q.NO	QUESTIONS
	1	Ohm's Law states that_____ (a) The current is directly proportional to voltage and inversely proportional to resistance (b) The voltage is directly proportional to the resistance and inversely proportional to current (c) Power is directly proportional to current and resistance (d) The current is directly proportional to resistance and inversely proportional to voltage **Ans:The current is directly proportional to voltage and inversely proportional to resistance**
1	2	The symbol Ω is used to denote _____ (a) Voltage (b) Resistance (c) Conductance (d) Inductance **Ans:Resistance**
1	3	The unit of power is_____ (a) Joule (J) (b) Watt (W) (c) Ampere (A) (d) Ohm (Ω) **Ans:Watt (W)**
1	4	Which of the following is true about Kirchhoff's Voltage Law (KVL)? (a) The sum of all voltages in a closed loop equals zero (b) The sum of currents entering a junction equals the sum of currents leaving the junction (c) Power is conserved in a closed loop (d) Resistance is constant in all materials **Ans:The sum of all voltages in a closed loop equals zero**
1	5	Ohm's Law relates the voltage across a resistor, the current through it, and its resistance. What happens to the current if the voltage is doubled while the resistance remains constant? (a) The current is halved (b) The current is doubled (c) The current remains the same (d) The current becomes zero **Ans:The current is doubled**
1	6	If a 12V battery is connected in series with a 3Ω resistor, what is the current flowing through the circuit? (a) 4A (b) 36A (c) 3A (d) 15A **Ans:4A**
1	7	A 6Ω resistor is in parallel with a current source that provides 2A. What is the voltage across the resistor? (a) 6V (b) 2V (c) 12V (d) 3V **Ans:12V**
1	8	In a circuit with three resistors connected in series, each with resistance R, the total resistance is (a) R/3 (b) 3R (c) 2R (d) 1/R **Ans:3R**
1	9	The SI unit of current is _____ (a) Coulomb (C) (b) Volt (V) (c) Ampere (A) (d) Joule (J)

Ans:Ampere (A)

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1	10	The Ohm's Law equation is_____ (a) V = IR (b) V = I/R (c) V = I*R2 (d) V = I2R **Ans:V = IR**
1	11	Which law states that the total current entering a junction is equal to the total current leaving the junction? (a) Kirchhoff's volatage Law (b) Kirchhoff's current Law (c) Ohm's Law (d) Norton's Theorem **Ans:Kirchhoff's current Law**
1	12	What is the equivalent resistance of resistors in series? (a) The sum of all resistances (b) The reciprocal of sum of all reciprocals of resistances (c) The product of all resistances (d) Zero **Ans:The sum of all resistances**
1	13	What is the equivalent resistance of resistors in parallel? (a) The sum of all resistances (b) The reciprocal of sum of all reciprocals of resistances (c) The product of all resistances (d) Zero **Ans:The reciprocal of sum of all reciprocals of resistances**
1	14	In mesh analysis, which law is primarily used to determine the unknown currents? (a) Kirchhoff's volatage Law (b) Kirchhoff's current Law (c) Ohm's Law (d) Norton's Theorem **Ans:Kirchhoff's volatage Law**
1	15	In node analysis, which law is primarily used to determine the unknown voltage? (a) Kirchhoff's volatage Law (b) Kirchhoff's current Law (c) Ohm's Law (d) Thevenin's Theorem **Ans:Kirchhoff's current Law**
1	16	What is the total resistance in a series circuit with resistances of 5 Ω, 10 Ω, and 15 Ω? (a) 30 Ω (b) 5 Ω (c) 1/30 Ω (d) 1/5 Ω **Ans:30 Ω**
1	17	What is the equivalent resistance of three 6 Ω resistors connected in series? (a) 18 Ω (b) 6 Ω (c) 22 Ω (d) 12 Ω **Ans:18 Ω**
1	18	What is source transformation in electrical circuits? (a) Converting a voltage source with a series resistance into an equivalent current source with a parallel resistance, and vice versa (b) Converting an AC source into a DC source (c) Converting a series circuit into a (d) Replacing a resistor with an equivalent capacitor

parallel circuit

Ans:Converting a voltage source with a series resistance into an equivalent current source with a parallel resistance, and vice versa

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1	19	What is the purpose of the star-delta (Y-Δ) transformation? (a) To simplify the analysis of complex circuits (b) To convert DC to AC (c) To increase circuit resistance (d) To reduce circuit current **Ans:To simplify the analysis of complex circuits**
1	20	Which analysis method uses loop currents as variables? (a) Mesh Analysis (b) Node Analysis (c) Thevenin's Theorem (d) Norton's Theorem **Ans:Mesh Analysis**
1	21	Which analysis method uses node voltages as variables? (a) Mesh Analysis (b) Node Analysis (c) Thevenin's Theorem (d) Norton's Theorem **Ans:Node Analysis**
1	22	In delta-to-star conversion, each star resistance is calculated using: (a) The sum of all delta resistances (b) product of adjacent delta resistors divided by the sum of all delta resistances. (c) Square root of each delta resistor (d) Half of the delta resistance **Ans:product of adjacent delta resistors divided by the sum of all delta resistances.**
1	23	Source transformation involves converting (a) Inductors to capacitors (b) Voltage source in series with resistance to current source in parallel with resistance (c) AC source to DC (d) Parallel circuit to series circuit **Ans:Voltage source in series with resistance to current source in parallel with resistance**
1	24	To convert a current source to a voltage source,_____ (a) Divide current by resistance (b) Multiply current by resistance (c) Multiply voltage by resistance (d) Divide voltage by resistance **Ans:Multiply current by resistance**
1	25	In a star network, the three resistors are all equal to 5 Ω. What is the value of each equivalent delta resistor? (a) 5 Ω (b) 15 Ω (c) 10 Ω (d) 7.5 Ω **Ans:15 Ω**
1	26	A 10 V voltage source in series with a 2 Ω resistor is equivalent to a current source of _____ (a) 4A (b) 5A (c) 20A (d) 15A **Ans:5A**
1	27	In a series circuit, the current through all resistors is_____ (a) Equal (b) Zero (c) Different (d) Alternating **Ans:Equal**

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1	28	In a parallel circuit, voltage across all branches is_____ (a) Zero (b) Same (c) Divided (d) Increasing **Ans:Same**
1	29	A 12 V voltage source in series with a 6 Ω resistor can be transformed into_____ (a) 2 A current source in parallel with 6 Ω (b) 0.5 A current source in parallel with 6 Ω (c) 12 A current source in series with 6 Ω (d) 6 A current source in series with 12 Ω **Ans:2 A current source in parallel with 6 Ω**
1	30	In mesh analysis, how many mesh equations are needed? (a) Equal to number of nodes (b) Equal to number of branches (c) Equal to number of independent loops (d) Equal to number of sources **Ans:Equal to number of independent loops**
1	31	What happens to the power dissipated in a resistor if both current and resistance are doubled? (a) Power remains the same (b) Power doubles (c) Power increases Eight times (d) Power decreases **Ans:Power increases Eight times**
1	32	In a parallel circuit, how is the total current related to the branch currents? (a) Equal to one of the branch currents (b) Less than the smallest branch current (c) Sum of all branch currents (d) Difference of branch currents **Ans:Sum of all branch currents**
1	33	Which of the following is a correct unit of resistance? (a) Watt (b) Volt (c) Ampere (d) Ohm **Ans:Ohm**
1	34	What is the unit of electrical conductance? (a) Ohm (b) Siemens (c) Farad (d) Henry **Ans:Siemens**
1	35	What is the current through a 4 Ω resistor when 16 V is applied across it? (a) 2A (b) 4A (c) 8A (d) 16A **Ans:4A**
1	36	In which condition are resistors said to be in parallel? (a) When same current flows through them (b) When they are connected end-to-end (c) When same voltage is applied across them (d) When one end is open **Ans:When same voltage is applied across them**

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1	37	What is the total power consumed in a parallel circuit with three branches, each consuming 5W? (a) 5 W (b) 10 W (c) 15 W (d) Depends on voltage **Ans:15 W**
1	38	Which of the following combinations results in the least equivalent resistance? (a) Two 4Ω resistors in series (b) Two 4Ω resistors in parallel (c) One 4Ω resistor only (d) One 8Ω resistor only **Ans:Two 4Ω resistors in parallel**
1	39	What happens to total resistance if more branches are added in parallel? (a) It increases (b) It remains the same (c) It decreases (d) It becomes infinite **Ans:It decreases**
1	40	In a parallel circuit, which of the following is always constant? (a) Current (b) Resistance (c) Voltage (d) Power **Ans:Voltage**
1	41	What is the power dissipated by a 10Ω resistor carrying 2A current? (a) 5W (b) 10W (c) 20W (d) 40W **Ans:40W**
1	42	The reciprocal of resistance is called_____ (a) Reactance (b) Impedance (c) Conductance (d) Inductance **Ans:Conductance**
1	43	The reference node in nodal analysis is usually called_____ (a) Source node (b) Ground node (c) Mesh node (d) Neutral node **Ans:Ground node**
1	44	What is the minimum number of equations required in nodal analysis for an 'n'-node network? (a) n (b) n - 1 (c) n + 1 (d) n^2 **Ans:n - 1**
1	45	In a nodal analysis problem, if one node is connected directly to ground, its voltage is: (a) Maximum (b) Floating (c) 0 V (d) Unknown **Ans:0 V**

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1	46	What is the unit of power in an electrical circuit? (a) Coulomb (b) Volt (c) Watt (d) Ohm **Ans:Watt**
1	47	A 24 Ω resistor is connected to a 12 V battery. What is the current through it? (a) 1A (b) 3A (c) 0.5A (d) 2A **Ans:0.5A**
1	48	What is the total voltage across two 5 V sources in series aiding? (a) 0 V (b) 10 V (c) 5V (d) 2.5 V **Ans:10 V**
1	49	What is the main function of a resistor in a DC circuit? (a) Increase voltage (b) Store charge (c) Limit current (d) Convert AC to DC **Ans:Limit current**
1	50	Which device is typically used to provide a DC voltage source? (a) Transformer (b) Battery (c) Inductor (d) Capacitor **Ans:Battery**
2	1	Superposition Theorem is valid only for which type of systems? (a) Linear (b) Non-linear (c) Digital (d) Unilateral **Ans:Linear**
2	2	What does the superposition Theorem state? (a) In a linear circuit with multiple sources, the total response is the sum of the responses caused by each source acting alone. (b) In a linear circuit with multiple sources, the total response is the difference of the responses caused by each source acting alone. (c) The total voltage in a circuit is the sum of individual voltages. (d) The total current in a circuit is the sum of individual currents. **Ans:In a linear circuit with multiple sources, the total response is the sum of the responses caused by each source acting alone.**
2	3	In Superposition, how is an independent current source deactivated? (a) Replaced by voltage source (b) Short circuited (c) Open circuited (d) Removed **Ans:Open circuited**
2	4	How many sources are considered at a time while applying Superposition Theorem? (a) All sources (b) One source (c) Two sources (d) No source **Ans:One source**

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2	5	While applying Superposition Theorem, in a network with two voltage sources and one current source, how many different circuit analyses are needed to find the total current through a resistor? (a) 1 (b) 2 (c) 3 (d) 4 **Ans:3**
2	6	Superposition Theorem is used to find _____ (a) Voltage or current (b) Power (c) Resistance (d) Capacitance **Ans:Voltage or current**
2	7	In the Superposition theorem, when considering one source at atime, all other voltage sources are_____ (a) Open circuited (b) Removed (c) Short circuited (d) Doubled **Ans:Short circuited**
2	8	In Superposition, what is done to other sources, while considering one source at a time? (a) Added (b) Multiplied (c) Deactivated (d) Increased **Ans:Deactivated**
2	9	What is the primary application of the Superposition Theorem? (a) Analysing circuits with multiple sources (b) Measuring resistance (c) Calculating power (d) Converting AC to DC **Ans:Analysing circuits with multiple sources**
2	10	What is the first step in applying the Superposition Theorem? (a) Consider one source at a time (b) Measure the total current in the circuit (c) Add all sources together (d) Calculate the total resistance **Ans:Consider one source at a time**
2	11	Superposition theorem cannot find_____ directly (a) Power (b) Voltage (c) Current (d) thevenins voltage **Ans:Power**
2	12	According to the superposition theorem, what should be done with other sources while considering one source? (a) Replace other sources with their internal resistance (b) Short-circuit the other voltage sources and open-circuit the other current sources (c) Open-circuit the other voltage sources and short-circuit the other current sources (d) Remove the other sources completely **Ans:Short-circuit the other voltage sources and open-circuit the other current sources**
2	13	In Thevenin's theorem, the Thevenin resistance is found by _____ (a) Keeping independent sources as they are (b) Short-circuiting voltage sources and open-circuiting current sources (c) Open-circuiting voltage sources and short-circuiting current sources (d) Removing all resistances **Ans:Short-circuiting voltage sources and open-circuiting current sources**

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2	14	Thevenin's theorem is used to replace a complex network by an equivalent _____ (a) Current source and series resistance (b) Voltage source and series resistance (c) Voltage source and parallel resistance (d) Current source and parallel resistance **Ans:Voltage source and series resistance**
2	15	Thevenin's theorem is used to_____ (a) Replace complex network (b) Increase resistance (c) Measure power (d) Connect sources **Ans:Replace complex network**
2	16	The Thevenin equivalent consists of_____ (a) A current source in series with resistance (b) A voltage source in series with resistance (c) A voltage source in parallel with resistance (d) Only a resistor **Ans:A voltage source in series with resistance**
2	17	Thevenin voltage is found by_____ (a) Short-circuiting the output (b) Measuring voltage across load (c) Open-circuiting the load (d) Removing all sources **Ans:Open-circuiting the load**
2	18	Which theorem helps in simplifying complex linear circuits? (a) KVL (b) Superposition (c) Thevenin (d) Ohm's Law **Ans:Thevenin**
2	19	Thevenin voltage is measured_____ (a) With load shorted (b) Without load (c) With high resistance (d) Using wattmeter **Ans:Without load**
2	20	Thevenin's and Norton's resistances are_____ (a) Equal (b) Different (c) Doubled (d) Halved **Ans:Equal**
2	21	Thevenin's theorem helps find_____ (a) Load current (b) Power loss (c) Frequency (d) Capacitance **Ans:Load current**
2	22	Thevenin equivalent is a _____ (a) Current source and resistor (b) Voltage source and resistor (c) Capacitor and resistor (d) Inductor and voltage source **Ans:Voltage source and resistor**

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2	23	What is Thevenin's Theorem used for? (a) Simplifying a complex circuit to a single voltage source and series resistance (b) Simplifying a complex circuit to a single current source and parallel resistance (c) Simplifying a complex circuit to multiple voltage source (d) Simplifying a complex circuit to multiple current source **Ans:Simplifying a complex circuit to a single voltage source and series resistance**
2	24	What is Thevenin equivalent voltage? (a) The open-circuit voltage across the load terminals (b) The short-circuit current across the load terminals (c) The total voltage in the circuit (d) The sum of all voltages in the circuit **Ans:The open-circuit voltage across the load terminals**
2	25	What is the main purpose of using Thevenin's Theorem in circuit analysis? (a) To simplify a complex circuit to a single voltage source and series resistance (b) To reduce current (c) To convert AC to DC (d) To increase power **Ans:To simplify a complex circuit to a single voltage source and series resistance**
2	26	How to calculate the Thevenin equivalent resistance? (a) Deactivating all independent sources and calculate the resistance seen form the load terminals (b) Sum the values of all resistors in the circuit (c) Measuring the resistance with all sources active (d) Replace voltage sources with open circuits & current sources withshort circuit **Ans:Deactivating all independent sources and calculate the resistance seen form the load terminals**
2	27	Norton's equivalent is useful for_____ (a) Only DC circuits (b) Reducing complex circuits (c) Calculating Power gain (d) Short circuiting loads **Ans:Reducing complex circuits**
2	28	Norton and Thevenin models are_____ (a) Interchangeable (b) Not related (c) Opposite (d) Identical always **Ans:Interchangeable**
2	29	Norton resistance is found by _____ (a) Shorting the load (b) Deactivating sources (c) Increasing the voltage (d) Connecting capacitor **Ans:Deactivating sources**
2	30	Norton current is measured by_____ (a) Voltmeter (b) Ammeter (c) Shorting the load (d) Removing source **Ans:Shorting the load**
2	31	Norton's equivalent circuit uses_____ (a) Voltage source (b) Inductor (c) Current source (d) Transformer **Ans:Current source**

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2	32	Norton's current source is found by _____ (a) Open circuiting the load (b) Short circuiting the load (c) Using wattmeter (d) Opening all sources **Ans:Short circuiting the load**
2	33	Norton's equivalent circuit contains _____ (a) Voltage source in series with resistor (b) Current source in parallel with resistor (c) Resistor only (d) Capacitor only **Ans:Current source in parallel with resistor**
2	34	In Norton's theorem, the parallel resistor is equal to_____ (a) Load resistance (b) Internal resistance of load (c) Thevenin resistance (d) Zero **Ans:Thevenin resistance**
2	35	What is Norton's Theorem used for? (a) Simplifying a complex circuit to a single current source and parallel resistance (b) Simplifying a complex circuit to a single voltage source and series resistance (c) Simplifying a complex circuit to multiple voltage source (d) Simplifying a complex circuit to multiple current source **Ans:Simplifying a complex circuit to a single current source and parallel resistance**
2	36	What is the Norton's equivalent current? (a) The short-circuit current across the load terminals (b) The open-circuit voltage across the load terminals (c) The total current in the circuit (d) The sum of all currents in the circuit **Ans:The short-circuit current across the load terminals**
2	37	How is the Norton equivalent resistance found? (a) By short-circuiting the load and calculating the equivalent resistance (b) By open-circuiting the load and calculating the equivalent resistance (c) By measuring the total resistance in the circuit (d) By adding all resistances in the circuit **Ans:By open-circuiting the load and calculating the equivalent resistance**
2	38	In Norton's Theorem, what is the equivalent resistance called? (a) Norton resistance (b) Internal resistance (c) Load resistance (d) Source resistance **Ans:Norton resistance**
2	39	What is the significance of Norton's equivalent circuit? (a) It simplifies the analysis of current distribution in complex networks (b) It measures voltage (c) It measures power (d) It reduces circuit resistance **Ans:It simplifies the analysis of current distribution in complex networks**
2	40	Norton's theorem states that any linear two- terminal circuit can be replaced by _____ (a) A voltage source in series with an impedance (b) A current source in parallel with an impedance (c) A voltage source in parallel with an impedance (d) A current source in series with an impedance **Ans:A current source in parallel with an impedance**

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2	41	Norton's theorem is used to find the _____ (a) Current through a load resistance (b) Voltage across a load resistance (c) Equivalent resistance of a circuit (d) Power delivered to a load resistance **Ans:Current through a load resistance**
2	42	If Thevenin resistance is 5 Ω, then Norton's resistance is _____ (a) 10Ω (b) 0Ω (c) 5Ω (d) Cannot be determined **Ans:5Ω**
2	43	What is the maximum power Transfer Theorem? (a) Maximum power is transferred when the load resistance equals the source resistance (b) Maximum power is transferred when the load resistance is zero (c) Maximum power is transferred when the load resistance is infinite (d) Maximum power is transferred when the source resistance is zero **Ans:Maximum power is transferred when the load resistance equals the source resistance**
2	44	Which theorem is used to determine the condition for maximum power delivered to the load? (a) Maximum power Transfer Theorem (b) Thevenin's Theorem (c) Norton's Theorem (d) Superposition Theorem **Ans:Maximum power Transfer Theorem**
2	45	How is the load resistance adjusted to achieve maximum power transfer in a circuit? (a) It is made equal to the source resistance (b) It is reduced to zero (c) It is increased to infinity (d) It is adjusted to half the source resistance **Ans:It is made equal to the source resistance**
2	46	The maximum power transfer theorem states that maximum power is transferred from a source to a load when _____ (a) The load resistance is equal to the source resistance (b) The load resistance is greater than the source resistance (c) The load resistance is less than source resistance (d) The load resistance is infinity **Ans:The load resistance is equal to the source resistance**
2	47	Which parameter is maximum in Maximum Power Transfer? (a) Voltage (b) Current (c) Power (d) Resistance **Ans:Power**
2	48	In Maximum Power Transfer, load gets_____ (a) Half power (b) Minimum power (c) No power (d) Maximum power **Ans:Maximum power**
2	49	Maximum power transfer happens when_____ (a) Load = 2 × Source resistance (b) Load = Source resistance (c) Load = Zero (d) Load = Infinite **Ans:Load = Source resistance**

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2	50	If source resistance is 6Ω, maximum power transfer occurs when _____ (a) Load = 0Ω (b) Load = 6Ω (c) Load = 12Ω (d) Load = ∞ **Ans:Load = 6Ω**
3	1	Form factor for sine wave is_____ (a) 1.414 (b) 1.11 (c) 0.707 (d) 0.637 **Ans:1.11**
3	2	The form factor of a sine wave is given by the ratio _____ (a) Average value to RMS value (b) RMS value to Average value (c) Peak value to RMS value (d) Peak value to Average value **Ans:RMS value to Average value**
3	3	The average value of a full sine wave is _____. (a) 0 (b) 0.637 × Maximum value (c) 0.707 × Maximum value (d) Equal to Maximum value **Ans:0**
3	4	The maximum value of an alternating quantity is called its _____. (a) RMS value (b) Average value (c) Peak value (d) Instantaneous value **Ans:Peak value**
3	5	Peak factor for sine wave is_____ (a) 1.11 (b) 1.414 (c) 0.707 (d) 0.637 **Ans:1.414**
3	6	The peak factor for a sine wave is the ratio of _____. (a) Maximum value to RMS value (b) RMS value to Average value (c) Average value to RMS value (d) Average value to Maximum value **Ans:Maximum value to RMS value**
3	7	The RMS (Root Mean Square) value of a sine wave is the ratio of _____. (a) Maximum value to √2 (b) Maximum value to 2 (c) Twice the maximum value to π (d) Maximum value to π **Ans:Maximum value to √2**
3	8	The instantaneous value of a sinusoidal wave is maximum at what angle? (a) 0° (b) 90° (c) 180° (d) 360° **Ans:90°**

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3	9	The RMS value of an alternating current is also known as its _____. (a) Peak value (b) Average value (c) Effective value (d) Maximum value **Ans:Effective value**
3	10	The instantaneous value of current in an AC circuit is given by _____. (a) i = Im sin (ωt) (b) i= Im cos(ωt) (c) i = Im tan (ωt) (d) i= Im cosine(ωt) **Ans:i = Im sin (ωt)**
3	11	In pure resistive circuit, power factor is_____ (a) 0 (b) 0.5 (c) 1 (d) 0.8 **Ans:1**
3	12	In a pure resistive AC circuit, the impedance is equal to _____. (a) R + jX (b) jX (c) R (d) 0 **Ans:R**
3	13	In a pure resistive AC circuit, the phase difference between voltage and current is _____. (a) 0° (b) 90° (c) 180° (d) 45° **Ans:0°**
3	14	In a pure inductive AC circuit, the current _____ the voltage by 90°. (a) Leads (b) Lags (c) Opposes (d) inphase **Ans:Lags**
3	15	In which of the following circuits the power factor is unity ? (a) Pure Resistive (b) Pure Inductive (c) Pure Capacitive (d) RLC circuit **Ans:Pure Resistive**
3	16	The phase angle in an AC circuit is defined as the angle between _____. (a) Current and resistance (b) Voltage and resistance (c) Voltage and current (d) Voltage and power **Ans:Voltage and current**
3	17	In a pure capacitive AC circuit, the current _____ the voltage by 90°. (a) Leads (b) Lags (c) Opposes (d) inphase **Ans:Leads**

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3	18	The capacitive reactance is _____. (a) Directly proportional to frequency (b) Inversely proportional to frequency (c) Independent of frequency (d) Equal to inductive reactance **Ans:Inversely proportional to frequency**
3	19	The inductive reactance is _____. (a) Directly proportional to frequency (b) Inversely proportional to frequency (c) Independent of frequency (d) Equal to inductive reactance **Ans:Directly proportional to frequency**
3	20	The unit of active power in an AC circuit is _____. (a) Watt (b) VA (c) VAR (d) kWh **Ans:Watt**
3	21	The unit of Reactive power in an AC circuit is _____. (a) Watt (b) VA (c) VAR (d) kWh **Ans:VAR**
3	22	The unit of apparent power in an AC circuit is_____ (a) Watt (b) VA (c) VAR (d) kWh **Ans:VA**
3	23	The symbol of impedance is _____. (a) R (b) X (c) Y (d) Z **Ans:Z**
3	24	The unit of impedance is _____. (a) Farad (b) Henry (c) Ohm (d) Siemens **Ans:Ohm**
3	25	In a series R–L circuit, the impedance is given by _____. (a) Z=R+jXC (b) Z=R+jXL (c) Z=R (d) Z = XL − XC **Ans:Z=R+jXL**
3	26	The magnitude of impedance in a series R–L circuit is _____. (a) √[R^2+XL^2] (b) [R+XL] (c) [R-XL] (d) √[R^2-XL^2] **Ans:√[R^2+XL^2]**

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3	27	The magnitude of impedance in a series R–C circuit is _____. (a) [R+XC] (b) √[R^2+XC^2] (c) [R-XC] (d) √[R^2-XC^2] **Ans:√[R^2+XC^2]**
3	28	In an RC series circuit, the current _____ (a) Lags the voltage by θ (b) Leads the voltage by θ (c) Always in phase (d) Opposite to voltage **Ans:Leads voltage by θ**
3	29	The active power dissipated in a 20 ohm resistor carrying current of 5A is (a) 50W (b) 250W (c) 500W (d) 100W **Ans:500W**
3	30	In a series RC circuit ,how does the current relate to the supply voltage in terms of phase? (a) Leads (b) Lags (c) In phase (d) Opposes **Ans:Leads**
3	31	Apparent power is given by _____ (a) VI sinφ (b) VI cosφ (c) VI (d) I^2R **Ans:VI**
3	32	If reactive power =0, the power factor is _____ (a) 0 (b) 0.5 (c) 1 (d) Undefined **Ans:1**
3	33	For 230V,5A load at PF=0.8, apparent power is_____ (a) 920VA (b) 1150VA (c) 1840VA (d) 460VA **Ans:1150VA**
3	34	In pure capacitive circuit, power factor is_____ (a) 1 (b) 0 (c) 0.5 (d) 0.8 **Ans:0**
3	35	Inductive reactance depends on_____ (a) Frequency and inductance (b) Resistance only (c) Voltage only (d) Capacitance only **Ans:Frequency and inductance**

U.NO	Q NO	QUESTIONS
3	36	Capacitive reactance depends on _____ (a) Resistance and inductance (b) Frequency and capacitance (c) Voltage and power factor (d) Current and resistance **Ans:Frequency and capacitance**
3	37	In a series RLC circuit, the phase angle between the current and voltage is (a) Always 0° (b) Leading or lagging depending on reactance (c) Always 90° (d) Always 180° **Ans:Leading or lagging depending on reactance**
3	38	Average value of sine wave over full cycle is_____ (a) V_m (b) $0.637V_m$ (c) 0 (d) $0.707V_m$ **Ans:0**
3	39	RMS value of V=100sin(ωt) is_____ (a) 70.7V (b) 100V (c) 141.4V (d) 50V **Ans:70.7V**
3	40	Power factor is ratio of_____ (a) P/Q (b) P/S (c) Q/S (d) S/P **Ans:P/S**
3	41	In a power triangle, the vertical side represents _____ (a) Active power (P) (b) Reactive power (Q) (c) Apparent power (S) (d) Power factor **Ans:Reactive power (Q)**
3	42	In a power triangle, the horizontal side represents _____ (a) Active power (P) (b) Reactive power (Q) (c) Apparent power (S) (d) Power factor **Ans:Active power (P)**
3	43	The hypotenuse of the power triangle represents _____ (a) Active power (P) (b) Reactive power (Q) (c) Apparent power (S) (d) Power factor **Ans:Apparent power (S)**
3	44	Power factor is defined as _____ (a) P/S (b) Q/S (c) P/Q (d) S/P **Ans:P/S**

U.NO	Q NO	QUESTIONS
3	45	In AC circuit, wattmeter measures_____ (a) Apparent power (b) Reactive power (c) Active power (d) Complex power **Ans:Active power**
3	46	In an AC circuit with a lagging power factor,the current---------- the voltage (a) Leads (b) Lags (c) In phase (d) Opposes **Ans:Lags**
3	47	Power triangle shows relationship between_____ (a) P,Q,S (b) V,I,Z (c) R,XL,XC (d) Vm, Vrms, Vavg **Ans:P,Q,S**
3	48	For purely reactive load, active power is_____ (a) Maximum (b) Minimum (c) Zero (d) Negative **Ans:Zero**
3	49	For a purely resistive load, the active power is_____ (a) Equal to reactive power (b) Maximum and equal to apparent power (c) Zero (d) Less than reactive power **Ans:Maximum and equal to apparent power**
3	50	Power factor correction uses_____ (a) Inductors (b) Capacitors (c) Resistors (d) Transformers **Ans:Capacitors**
4	1	In electrical engineering, the symbol j is used to represent _____ (a) Real number (b) Square root of –1 (c) Resistance (d) Voltage **Ans:Square root of –1**
4	2	What does 'j' represent in electrical engineering? (a) Current (b) Voltage (c) 90° phase shift (d) Resistance **Ans:90° phase shift**
4	3	A complex number Z=4+j3 is expressed in _____ (a) Polar form (b) Rectangular form (c) Exponential form (d) Trigonometric form **Ans:Rectangular form**

U.NO	Q NO	QUESTIONS
4	4	The complex number $Z=7\angle 45^\circ$ is expressed in _____ (a) Polar form (b) Rectangular form (c) Exponential form (d) Trigonometric form **Ans:Polar form**
4	5	In the complex plane, the vertical axis represents _____ (a) Real part (b) Imaginary part (c) Magnitude (d) Angle **Ans:Imaginary part**
4	6	In the complex plane, the horizontal axis represents _____ (a) Real part (b) Imaginary part (c) Magnitude (d) Angle **Ans:Real part**
4	7	The magnitude of $Z=6-j8$ is _____ (a) 10 (b) 12 (c) 6 (d) 8 **Ans:10**
4	8	Admittance (Y) is the reciprocal of _____ (a) Resistance (b) Reactance (c) Impedance (d) Admittance **Ans:Impedance**
4	9	The imaginary part of admittance is called _____ (a) Conductance (b) Susceptance (c) Resistance (d) Reactance **Ans:Susceptance**
4	10	The real part of admittance is called _____ (a) Conductance (b) Susceptance (c) Resistance (d) Reactance **Ans:Conductance**
4	11	In admittance Y=G+jB, B represents_____ (a) Conductance (b) Susceptance (c) Resistance (d) Reactance **Ans:Susceptance**
4	12	In admittance Y=G+jB, G represents_____ (a) Conductance (b) Susceptance (c) Resistance (d) Reactance **Ans:Conductance**

U.NO	Q NO	QUESTIONS
4	13	Conductance is the reciprocal of_____ (a) Resistance (b) Reactance (c) Impedance (d) Admittance **Ans:Resistance**
4	14	Unit of conductance and susceptance is _____ (a) Ohms (Ω) (b) Farad (F) (c) Siemens (S) (d) Henry (H) **Ans:Siemens (S)**
4	15	Conductance (G) has the same unit as _____ (a) Resistance (b) Reactance (c) Admittance (d) Impedance **Ans:Admittance**
4	16	Admittance (Y) is measured in _____ (a) Ohms (Ω) (b) Siemens (S) (c) Volts (V) (d) Coulombs (C) **Ans:Siemens (S)**
4	17	Conductance of a parallel circuit is_____ (a) The reciprocal of the resistance (b) The product of resistance and reactance (c) The sum of resistance and reactance (d) The reciprocal of the reactance **Ans:The reciprocal of the reactance**
4	18	What is the conductance (G) of a resistor with 5Ω resistance? (a) 5℧ (b) 0.2℧ (c) 1℧ (d) 10℧ **Ans:0.2℧**
4	19	Admittance triangle consists of_____ (a) Resistance, Reactance, Impedance (b) Conductance, Susceptance, Admittance (c) Voltage, Current, Power (d) Real power, Reactive power, Apparent power **Ans:Conductance, Susceptance, Admittance**
4	20	The condition for series resonance in an RLC circuit is _____ (a) XL=XC (b) XL>XC (c) XL<XC (d) R=XL+XC **Ans:XL=XC**
4	21	The condition for parallel resonance in an RLC circuit is _____ (a) XL=XC (b) XL>XC (c) XL<XC (d) R=XL+XC **Ans:XL=XC**

U.NO	Q NO	QUESTIONS
4	22	In series resonance, the impedance (Z) of the circuit is _____ (a) Minimum (b) Maximum (c) Zero (d) Infinite **Ans:Minimum**
4	23	At series resonance, the circuit current is _____ (a) Maximum (b) Minimum (c) Zero (d) Infinite **Ans:Maximum**
4	24	Power factor at series resonance is _____ (a) 0 (b) Unity (c) Leading (d) Lagging **Ans:Unity**
4	25	At parallel resonance, the line current is_____ (a) Maximum (b) Minimum (c) Zero (d) Infinite **Ans:Minimum**
4	26	In a practical parallel resonant circuit (with coil resistance R), the impedance at resonance is_____ (a) Minimum (b) Maximum (c) Zero (d) Infinite **Ans:Maximum**
4	27	At series resonance, the phase angle between voltage and current is_____ (a) 45° (b) 90° (c) 0° (d) 180° **Ans:0°**
4	28	Parallel resonance is also known as _____ (a) Voltage resonance (b) Power resonance (c) Energy resonance (d) Current resonance **Ans:Current resonance**
4	29	Series resonance is also known as _____ (a) Voltage resonance (b) Power resonance (c) Energy resonance (d) Current resonance **Ans:Voltage resonance**
4	30	At resonance L and C voltages are_____ (a) Equal (b) Unequal (c) Zero (d) Infinite **Ans:Equal**

U.NO	Q NO	QUESTIONS
4	31	The Q-factor of a resonant circuit is a measure of _____ (a) Power factor (b) Efficiency (c) Selectivity (sharpness of resonance) (d) Bandwidth **Ans:Selectivity (sharpness of resonance)**
4	32	Quality factor (Q) depends on_____ (a) Power (b) Current (c) Both Resistance and Reactance (d) Voltage **Ans:Both Resistance and Reactance**
4	33	Higher the Q-factor, the circuit is _____ (a) Less selective (b) More selective (c) Broader bandwidth (d) Poor in resonance **Ans:More selective**
4	34	What does the Q-factor (Quality Factor) of a circuit mainly tell us? (a) How good the circuit is at picking one specific frequency (b) How much power the circuit can handle (c) How much it amplifies current (d) How efficiently it converts energy **Ans:How good the circuit is at picking one specific frequency**
4	35	What happens to a circuit's frequency selection ability when its Q-factor increases? (a) It can select more frequencies but less precisely (b) It becomes better at selecting one exact frequency (c) It stops responding to all frequencies (d) It converts energy more efficiently **Ans:It becomes better at selecting one exact frequency**
4	36	High Q-factor circuits are characterized by _____ (a) Wide bandwidth (b) Narrow bandwidth (c) No bandwidth (d) Infinite bandwidth **Ans:Narrow bandwidth**
4	37	The unit of Q-factor is _____ (a) Ohms (b) Farads (c) No unit (d) Siemens **Ans:No unit**
4	38	High Q circuits are used in _____ (a) Speakers (b) Radio tuners (c) Power supplies (d) DC motors **Ans:Radio tuners**
4	39	Quality factor is ratio of_____ (a) Energy stored/Energy lost (b) Voltage/Current (c) Power/Energy (d) Resistance/Reactance **Ans:Energy stored/Energy lost**

U.NO	Q NO	QUESTIONS
4	40	High Q circuit means_____ (a) Low losses (b) High losses (c) No resistance (d) Pure reactance **Ans:Low losses**
4	41	The resonant frequency depends on _____ (a) Only R (b) Both L and C (c) Only L (d) R, L, and C **Ans:Both L and C**
4	42	Resonance frequency is calculated using _____ (a) Inductance and resistance of the circuit (b) Inductance and capacitance of the circuit (c) Resistance and capacitance of the circuit (d) Only the supply voltage **Ans:Inductance and capacitance of the circuit**
4	43	Time period of 50 Hz AC supply is _____ (a) 0.002 Second (b) 0.02 Second (c) 0.2 Second (d) 2 Second **Ans:0.02 Second**
4	44	For a series RC circuit, increasing the frequency will _____ (a)Increase capacitive reactance (b) Decrease capacitive reactance (c) Have no effect on reactance (d) Increase phase angle **Ans:Decrease capacitive reactance**
4	45	The SI unit of frequency is _____ (a) Newton (N) (b) Hertz (Hz) (c) Radian (rad) (d) Joule (J) **Ans:Hertz (Hz)**
4	46	The bandwidth of a resonant circuit is defined as _____ (a) Difference between maximum and minimum current (b) Difference between upper and lower half-power frequencies (c) Frequency at resonance (d) Product of L and C **Ans:Difference between upper and lower half-power frequencies**
4	47	The bandwidth of a resonant circuit is calculated as _____ (a) f_upper + f _lower (b) f_upper - f_ lower (c) f _upper x f_lower (d) f _upper / f_lower **Ans:f_upper - f_ lower**
4	48	Line current in a parallel circuit is minimum when_____ (a) Resonance occurs (b) Zero frequency (c) Maximum branch current (d) Infinite frequency **Ans:Resonance occurs**

U.NO	Q NO	QUESTIONS
4	49	Admittance is reciprocal of_____ (a) Reactance (b) Resistance (c) Impedance (d) Conductance **Ans:Impedance**
4	50	The SI unit of Admittance is _____. (a) Farad (b) Henry (c) Ohm (d) Siemens **Ans:Siemens**
5	1	What is the main advantage of a 3-phase system over a single-phase system? (a) Higher efficiency (b) Lower voltage (c) Less power (d) Complexity **Ans:Higher efficiency**
5	2	In a star connection, line voltage is ____ the phase voltage. (a) √3 times (b) Equal to (c) 1/√3 times (d) 3 times **Ans:√3 times**
5	3	In a delta connection, the line current is ____ the phase current. (a) √3 times (b) Equal to (c) 1/√3 times (d) 3 times **Ans:√3 times**
5	4	In a star connection, the line current is ____ the phase current. (a) √3 times (b) Equal to (c) 1/√3 times (d) 3 times **Ans:Equal to**
5	5	In a delta connection, the line voltage is ____ the phase voltage. (a) √3 times (b) Equal to (c) 1/√3 times (d) 3 times **Ans:Equal to**
5	6	In a balanced three-phase system, what will be the algebraic sum of the instantaneous values of the three phase voltages? (a) Zero (b) One (c) Three (d) Infinite **Ans:Zero**
5	7	Which method or instrument setup is used to measure the total power in a three-phase, three-wire system? (a) Two wattmeter method (b) One wattmeter method (c) Voltmeter (d) Ammeter **Ans:Two wattmeter method**

U.NO	Q NO	QUESTIONS
5	8	When wiring a three-phase motor, what should the technician check to make sure it spins in the right direction? (a) Order of voltages (b) Magnitude of currents (c) Power factor (d) Type of load **Ans:Order of voltages**
5	9	Phase sequence in 3-phase system refers to _____ (a) Order of voltages (b) Magnitude of currents (c) Power factor (d) Type of load **Ans:Order of voltages**
5	10	During a fault in a power system, the voltages and currents are not the same in all three phases. Which concept or method should be used to study this unbalanced condition? (a) symmetrical components (b) Balanced systems (c) DC circuits (d) Resistance circuits **Ans:symmetrical components**
5	11	In a balanced load, all phase impedances are _____ (a) Equal (b) Zero (c) Different (d) Purely inductive **Ans:Equal**
5	12	The significance of using a balanced load in a 3-phase system is_____ (a) Neutral carries maximum current (b) Neutral current becomes zero (c) Voltage becomes unbalanced (d) Phase sequence changes **Ans:Neutral current becomes zero**
5	13	An engineer is testing a three-phase load and observes that all three phase impedances have the same magnitude and phase angle. What type of load is this? (a) Balanced load (b) Zero impedance load (c) Unbalanced load (d) Purely inductive **Ans:Balanced load**
5	14	Symmetrical components are used to analyze _____ (a) Unbalanced systems (b) Balanced systems (c) DC circuits (d) Resistance circuits **Ans:Unbalanced systems**
5	15	In symmetrical components, the zero-sequence component represents _____ (a) Balanced positive rotation set (b) Balanced negative rotation set (c) Equal magnitude, in-phase set (d) Opposite phase angles **Ans:Equal magnitude, in-phase set**
5	16	The phase sequence R-B-Y corresponds to _____ (a) Clockwise (b) Anti-clockwise (c) Neutral (d) Cannot predict **Ans:Anti-clockwise**

U.NO	Q NO	QUESTIONS
5	17	While connecting a three-phase alternator to the grid, the technician checks the phase sequence and finds it to be R-Y-B. What direction of rotation does this indicate? (a) Clockwise (b) Anti-clockwise (c) Neutral (d) Cannot predict **Ans:Clockwise**
5	18	In a balanced three-phase circuit, the total real power is given by _____ (a) VL IL (b) Vph Iph (c) √3VL IL CosØ or 3Vph Iph CosØ (d) √3 VL IL SinØ or 3Vph Iph SinØ **Ans:√3 VL IL CosØ or 3Vph Iph CosØ**
5	19	In a balanced delta load, the power consumed is _____ (a) VL IL (b) Vph Iph (c) √3VL IL CosØ or 3Vph Iph CosØ (d) √3 VL IL SinØ or 3Vph Iph SinØ **Ans:√3 VL IL CosØ or 3Vph Iph CosØ**
5	20	The two-wattmeter method in a three-phase system is used to measure _____ (a) Only active power (b) Only reactive power (c) Power factor (d) Apparent power **Ans:Only active power**
5	21	The sum of the readings of two wattmeters in a balanced 3-phase system gives _____ (a) Apparent power (b) Reactive power (c) Power factor (d) Active power **Ans:Active power**
5	22	The difference between the two wattmeter readings in a balanced 3-phase system is used to calculate _____ (a) Apparent power (b) Reactive power (c) Power factor (d) Active power **Ans:Reactive power**
5	23	In a balanced star-connected load, the neutral current will be_____ (a) Zero (b) IL (c) √3IL (d) 3IPh **Ans:Zero**
5	24	While analyzing a three-phase generator output, an engineer observes the line voltages. What is the phase difference between them? (a) 60° (b) 90° (c) 120° (d) 180° **Ans:120°**
5	25	In a balanced 3-phase system, the phase difference between any two line voltages is _____ (a) 60° (b) 90° (c) 120° (d) 180° **Ans:120°**

U.NO	Q NO	QUESTIONS
5	26	The power factor of a purely inductive 3-phase load is_____ (a) 1 (b) 0.8 (c) 0.5 (d) 0 **Ans:0**
5	27	For a balanced 3-phase load, the ratio of total power to per-phase power is _____ (a) 1 (b) √3 (c) 3 (d) 2 **Ans:3**
5	28	In a star-connected system, why is the neutral conductor provided? (a) To carry unbalanced current (b) To reduce voltage (c) To increase current (d) To reduce conductor size **Ans:To carry unbalanced current**
5	29	An electrician needs to verify the R-Y-B order before connecting a three-phase motor. Which instrument should be used? (a) Wattmeter (b) Voltmeter (c) Phase sequence indicator (d) Ammeter **Ans:Phase sequence indicator**
5	30	In a balanced three-phase system, what does the power factor angle represent? (a) The angle between voltage and current (b) The angle between line and phase quantities (c) The angle between two phases (d) The angle between power and energy **Ans:The angle between voltage and current**
5	31	A balanced delta-connected load is supplied with a line voltage of 400 V. Calculate the phase voltage. (a) 110 V (b) 230 V (c) 690 V (d) 400 V **Ans:400 V**
5	32	A balanced 3-phase system has: VR=230 sin ωt, VY=230 sin(ω-120)t, VB=230 sin(ω-240)t, then what is VR + VY + VB at any instant? (a) Vph (b) VL (c) 0 V (d) √3Vph **Ans:0 V**
5	33	In a wye-connected system, the voltage between any two lines is called _____ (a) Phase voltage (b) Line voltage (c) Neutral voltage (d) Reference voltage **Ans:Line voltage**
5	34	In a three-phase four-wire system, the fourth wire is used for _____ (a) Carrying phase current (b) Carrying line current (c) Carrying neutral current (d) Improving power factor **Ans:Carrying neutral current**

U.NO	Q NO	QUESTIONS
5	35	In the two-wattmeter method, the total power is calculated as_____ (a) W1 / W2 (b) W1 - W2 (c) W1 * W2 (d) W1 + W2 **Ans:W1 + W2**
5	36	The voltage rating mentioned on a three-phase motor typically refers to _____ (a) Phase voltage (b) Neutral voltage (c) peak voltage (d) Line voltage **Ans:Line voltage**
5	37	If one wattmeter reads zero in the two-wattmeter method, the power factor is _____ (a) 0 (b) 1 (c) 0.5 (d) 0.866 **Ans:0.5**
5	38	Three-phase power finds its most characteristic application in _____ (a) Residential lighting circuits (b) Small appliance power supplies (c) Industrial motor systems (d) Consumer electronics charging **Ans:Industrial motor systems**
5	39	In a 3-phase system, which type of load results in a power factor angle of 0°? (a) Purely inductive (b) Purely resistive (c) Purely capacitive (d) Balanced reactive **Ans:Purely resistive**
5	40	For a balanced load in the two-wattmeter method, if W1=W2, the power factor is _____ (a) 0 (b) 1 (c) 0.5 (d) 0.866 **Ans:1**
5	41	The ratio of line voltage to phase voltage in a star connection is_____ (a) 1 : 1 (b) 1 : √3 (c) 2 : 1 (d) √3 : 1 **Ans:√3 : 1**
5	42	The ratio of line current to phase current in a delta connection is_____ (a) 1 : 1 (b) 1 : √3 (c) 2 : 1 (d) √3 : 1 **Ans:√3 : 1**
5	43	In a balanced 3-phase system, the vector sum of the line currents is _____ (a) √3IL (b) Iph (c) IL (d) Zero **Ans:Zero**

5 44 The power factor of a purely resistive 3-phase load is_____

(a) 0 (b) 0.5

(c) 1 (d) 0.866

Ans:1

5 45 In a 3-phase generator, the voltage of phase R is at its maximum value at 0∘. At what phase angle phase Y reach its maximum value?

(a) 60° (b) 90°

(c) 120° (d) 180°

Ans:120°

5 46 The phase displacement between any two phases in a 3-phase system is _____

(a) 60° (b) 90°

(c) 120° (d) 180°

Ans:120°

5 47 In two wattmeter method, If the power factor of three phase circuit is Unity, then _____

(a) W1 = - W2 (b) W1 = 0, W2 = Total power

(c) W1 = 0.5 * W2 (d) W1 = W2

Ans:W1 = W2

5 48 In a star connection, the line voltage leads the phase voltage by_____

(a) 30° (b) 60°

(c) 90° (d) 120°

Ans:30°

5 49 The power in a single phase of a balanced 3-phase system is_____

(a) VL IL (b) VL IL cosφ

(c) Vph Iph cosφ. (d) 3 Vph Iph cosφ.

Ans:Vph Iph cosφ.

5 50 Which method measures total power in a three-phase, three-wire system?

(a) Ammeter method (b) Two-wattmeter method

(c) One-wattmeter method (d) Power factor meter method

Ans:Two-wattmeter method

PART – B & PART -C QUESTIONS

PART - B

UNIT –I

1 Draw the 3 Resistances connected in series and write the equation to calculate the Equivalent Resistance.

2 Draw the 3 Resistances connected in parallel and write the equation to calculate the Equivalent Resistance.

3 State and Explain Kirchhoff's First law.

4 State and Explain Kirchhoff's Second law.

5 A circuit has a node with three branches: 2A current entering the node, 1A current leaving the node and an unknown current I. Using Kirchhoff's Current Law (KCL), find the value and direction of I.

6 Draw the Star (Y) to Delta (Δ) Transformation and write the expressions for equivalent Δ resistances in terms of Y resistances.

7 Draw the Delta (Δ) to Star (Y) Transformation and write the expressions for equivalent Y resistances in terms of Δ resistances.

8 A loop has a 10 V battery and a total resistance of 5 Ω. How much energy is dissipated in 2 seconds?

9 A bulb is rated 60 W, 120 V. Find the current through it.

10 A resistor of 5 Ω carries 3 A current. Find the power dissipated.

UNIT-II

1 Draw the Thevenin's equivalent circuit for a linear circuit.

2 Write the steps for Thevenin's equivalent circuit.

3 Draw the Norton's equivalent circuit for a linear circuit.

4 Write the steps for Norton's theorem .

5 Convert a Thevenin equivalent of 12 V in series with 6 Ω into its Norton form.

6 What is the efficiency at maximum power transfer?

7 A load receives maximum power of 18 W from a source. If the Thevenin resistance is 6 Ω, what is the Thevenin voltage?

8 A source has a Thevenin voltage of 24 V and Thevenin resistance of 6 Ω. What load resistance should be connected to get maximum power?

9 Compare Thevenin and Norton equivalents.

10 Write the steps involved while applying the Superposition Theorem.

UNIT-III

1 Draw the circuit diagram of an AC pure resistive circuit with its phasor diagram.

2 Write the equations for current and voltage in: (i) AC pure resistive circuit (ii) AC pure inductive circuit (iii) AC pure capacitive circuit

3 Draw the circuit diagram of an AC pure inductive circuit with its phasor diagram.

4 Draw the circuit diagram of an AC pure capacitive circuit with its phasor diagram.

5 Draw the RL series circuit with its phasor diagram.

6 Draw the RC series circuit with its phasor diagram.

7 Write the equations for current and voltage in: (i) RL series circuit (ii) RC series circuit

8 Draw the RLC series circuit with its phasor diagram.

9 Draw the Power Triangle for an AC circuit and Write the expression for Power Factor.

10 Define the following terms: (i) Active Power (P) (ii) Reactive Power (Q) (iii) Apparent Power (S)

UNIT-IV

1 Write the mathematical expression of admittance and show its representation using the Admittance triangle.

2 Write the mathematical expression of Impedance and show its representation using the Impedance triangle.

3 Convert $z = 3+j4$ into polar form

4 Convert $z=10\angle 30$ into rectangular form

5 Write any three effects of Series Resonance.

6 Write any three effects of Parallel Resonance.

7 In an RLC circuit, if L=20 H, C=0.5F, find the resonant frequency.

8 If Y1=0.06-j0.08 and Y2=0.08+j0.06, Find the total admittance.

9 If $Z=6+j8\ \Omega$, find the Admittance.

10 If V=100, I=19.7 A and $\emptyset=8.44^{o}$, Find the Power.

UNIT-V

1 Draw the star (Y) connection of a three-phase system and write the line and phase voltages relationship.

2 Draw the delta (Δ) connection of a three-phase system and indicate line and phase currents.

3 With neat diagram, show the phase sequence of a three-phase system.

4 Draw the circuit connection diagram for measurement of 3-phase power by two-wattmeter

method.

5 Draw the star-connected balanced load system.

6 Draw the delta-connected balanced load system.

7 Represent the symmetrical components (positive, negative, zero sequence) using a simple phasor diagram.

8 In a 3-phase, 3-wire system using the two wattmeter method, the readings are: W1=3 kW, W2=1 kW. Find the power factor.

9 Write the significance of a 3-phase system.

10 In a balanced 3-phase, 3-wire system, two wattmeters are used to measure power. The readings of the wattmeters are 4 kW and 2 kW. Determine the total power consumed by the system.

PART- C

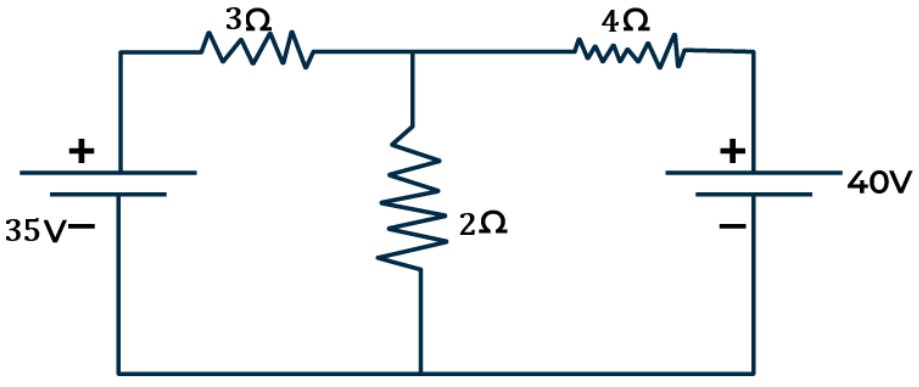
UNIT-1

1 An 8 Ω resistor is connected in series with a parallel combination of two resistors of 18 Ω and 12 Ω. If the voltage across the 8 Ω resistor is 20 V, calculate the power dissipated in each resistor.

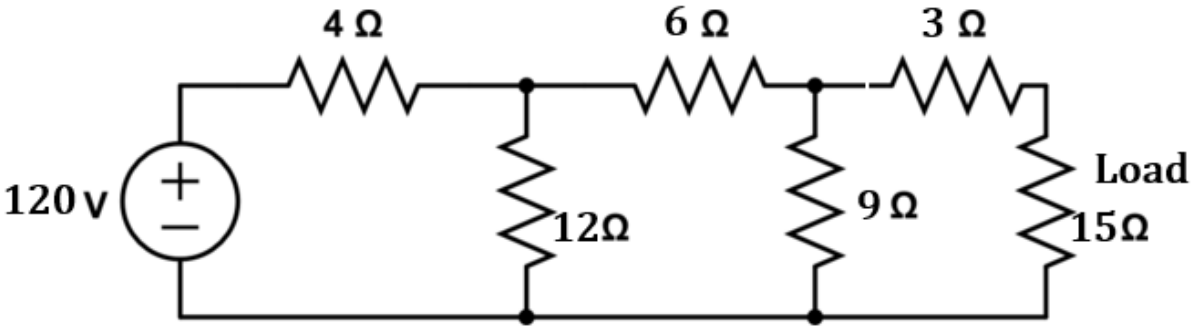
2 Derive an expression for the equivalent resistance when three resistors are connected in Series and Parallel.

3 State and illustrate Kirchhoff's Current Law (KCL) and Kirchhoff's Voltage Law (KVL).

4 Analyze the given electrical circuit using Kirchhoff's laws and compute the current in the 2 Ω resistor.

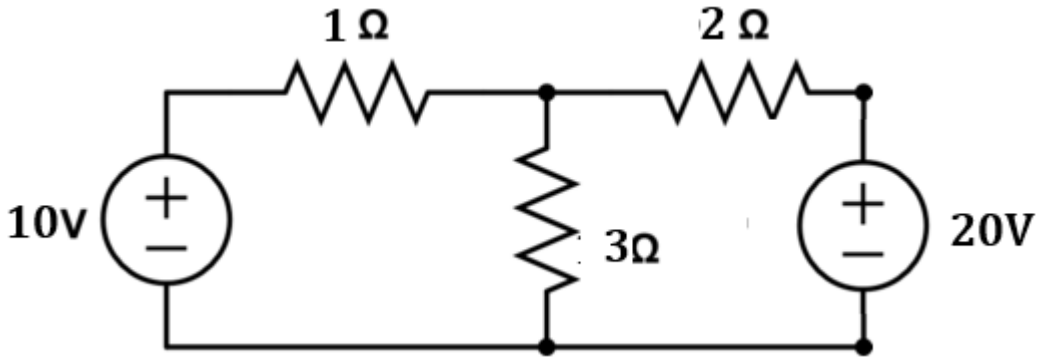


5 In the circuit given below, apply the Mesh Current Analysis method to determine the load current and the power delivered to the load.

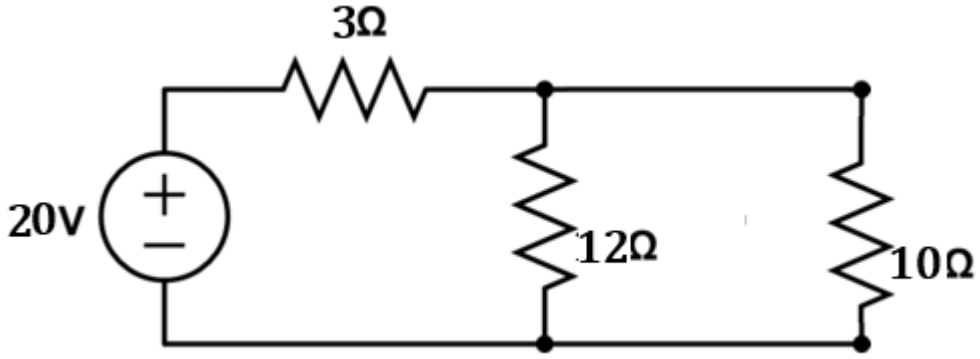


UNIT-II

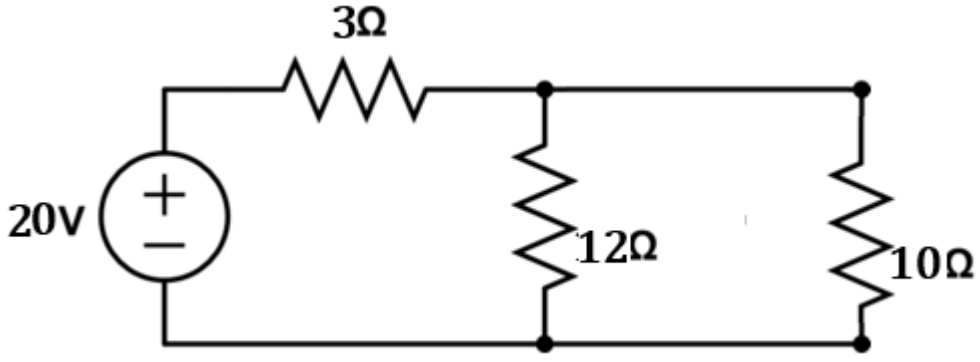
1 For the given electrical circuit, apply the Superposition Theorem to determine the current flowing through the 3 Ω resistor.



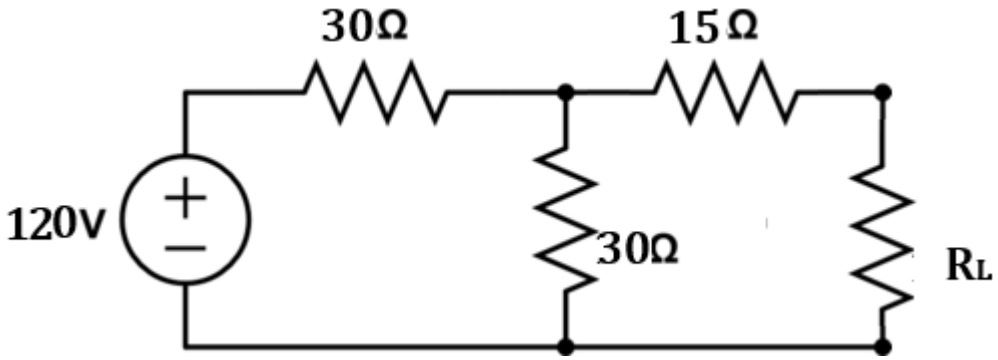
2 For the circuit given below, determine the current through the 10 Ω resistor using Thevenin's Theorem.



3 For the circuit given below, find the current through 10 Ω Resistance by using Norton's theorem.



4 Calculate the value of the load resistance for maximum power transferred from source to load. Also find the value of maximum power for the circuit given below:



5 Describe the systematic steps involved in applying Thevenin's Theorem to simplify an electrical circuit and determine the load current.

UNIT-III

1 With a neat sketch, explain an R–L series circuit and derive the expression for its impedance.

2 With a neat sketch, explain an R–C series circuit and derive the expression for its impedance.

3 With a neat sketch, explain an RLC series circuit and derive the expression for its impedance.

4 The alternating current in a circuit is given by i=141.14 sin(314.2t)

Find

(a) RMS value of the current

(b) Frequency of the current

(c)Instantaneous value of the current at t=0.02second

5 A series R–L–C circuit having a resistance of 50 Ω, capacitance of 40 μF, and inductance of 0.15 H is connected across a 230 V, 50 Hz AC supply.

Calculate

(a)Impedance of the circuit,

(b)Power factor, and

(c)Power consumed by the circuit.

UNIT –IV

1 Differentiate between series resonance and parallel resonance circuits, highlighting their characteristics and applications.

2 A series RLC circuit has R=10 Ω, L=20 mH , and C=0.5 μF and is connected to a 200 V AC supply

Find

(a)Resonant frequency

(b)Quality factor

(c)half power frequencies

(d)Band width

(e)Power consumed at resonance if applied voltage to circuit is 200 V

3

State the condition for resonance and derive the expression for resonant frequency of a series RLC circuit.

4 State the condition for resonance and derive the expression for resonant frequency of a Pure RLC parallel circuit.

5 A coil with resistance 5 Ω and inductive reactance 8 Ω is connected in series with a capacitor to form a series resonant circuit at 50 Hz. The circuit is supplied with 220 V AC.

Calculate:

(a) the capacitance

(b) the current at resonance.

UNIT-V

1 The power input to a three-phase induction motor is measured using the two-wattmeter method. The wattmeter readings are 860 W and 240 W.

Determine:

(a) the total input power, and

(b) the power factor of the motor.

2

Derive the expression for total power in a three-phase, balanced star-connected load using the two-wattmeter method.

3 Three identical coils, each having a resistance of 10 Ω and an inductance of 0.03 H, are connected in delta across a three-phase, 400 V, 50 Hz supply.

Calculate:

(a) Phase current

(b) Line current

(c) Power factor

(d) Total power consumed

4 Three identical coils, each having a resistance of 20 Ω and an inductive reactance of 15Ω, are connected in star across a three-phase, 400 V, 50 Hz supply.

Calculate:

(a) Phase current

(b) Line current

(c) Power factor

(d) Total power consumed

5 Prove that the sum of readings of two wattmeters connected to 3 phase balanced load circuit in two wattmeter method is equal to three phase power