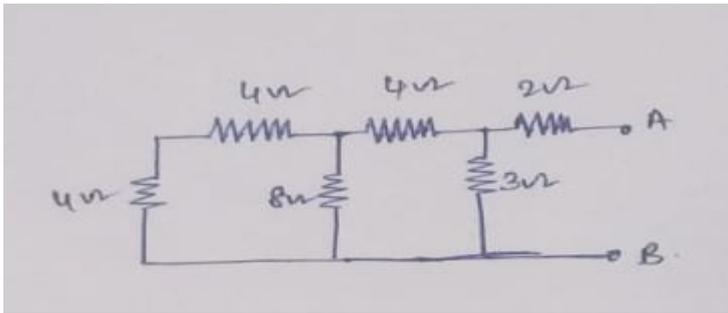


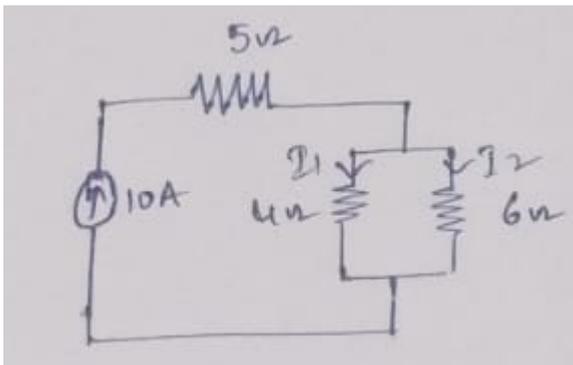
UNIT-I

Short Answer Questions

1. State and Explain Ohm's Law.
2. Write voltage and current across Inductor and Resistor.
3. State Kirchoff's Laws.
4. State Thevenin's theorem.
5. State Norton's Theorem.
6. State Superposition Theorem and its limitations.
7. Write the difference between Thevenin's theorem and Norton's theorem.
8. Calculate the equivalent resistance between terminals A&B for the circuit shown



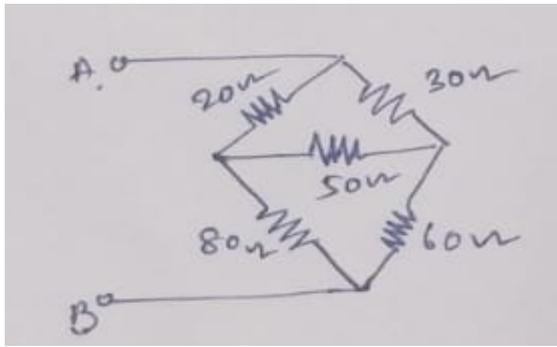
0. Write the expressions for stored energy in Inductor and Capacitor.
0. Determine the current I_1 and I_2 .



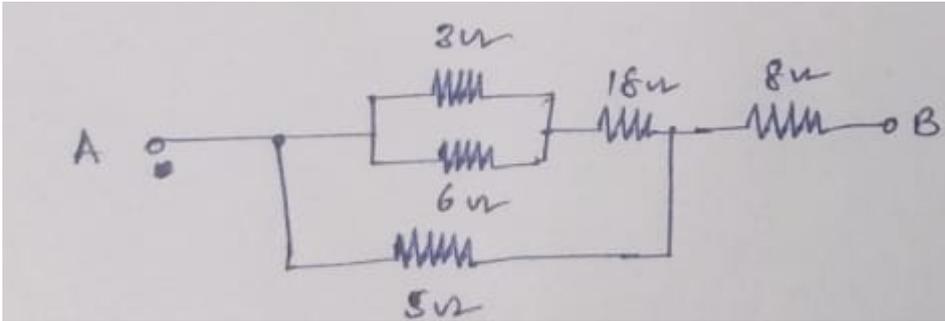
0. Write the equations to transform Delta to star connected resistors. Find the equivalent star connected resistances when three resistances are connected 10Ω, 20Ω & 30Ω are connected Delta.
0. Write the equations to transform star and Delta connected resistors. Find the equivalent delta connected resistances when three resistances 30Ω, 40Ω and 60Ω are connected in star.

Long Answer Questions

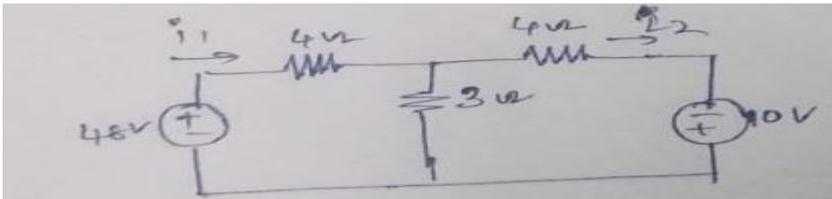
1. State and explain Thevenin's Theorem with help of neat circuit diagrams and their related expressions.
2. State and explain Norton's Theorem with help of neat circuit diagrams and their related expressions.
3. State and explain Super position Theorem with help of neat circuit diagrams and their related expressions.
4. Find the resistance connected between terminals A & B.



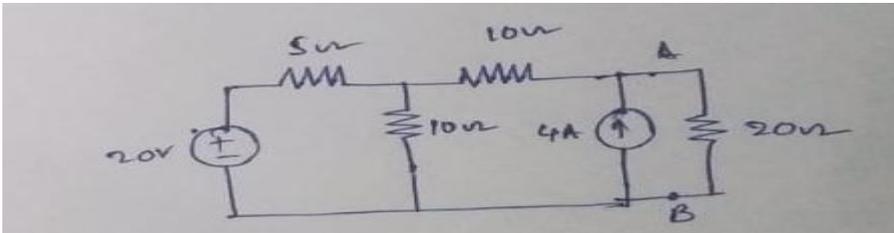
0. Calculate the effective resistance of the following combination of resistances and the voltage drop across each resistance when a potential difference of 60 Volts is applied between terminals A & B.



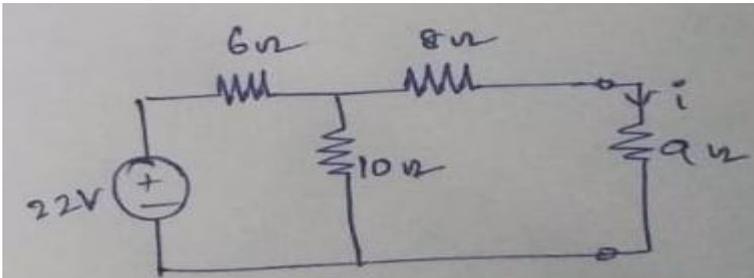
0. Solve for current in 3 ohm resistance in the circuit shown below using Thevenin's theorem.



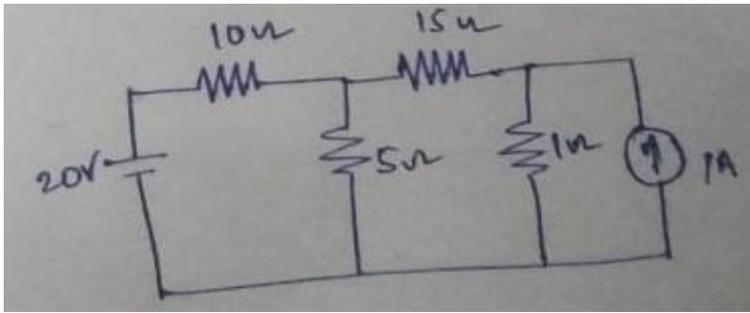
0. Find the current flowing through 20 ohm resistor by using Norton's theorem.



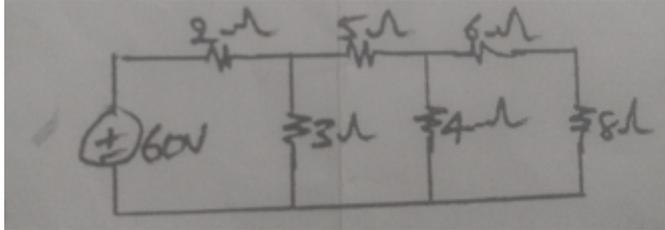
0. Using Thevenin's theorem find the current "i" in 9 ohm resistor.



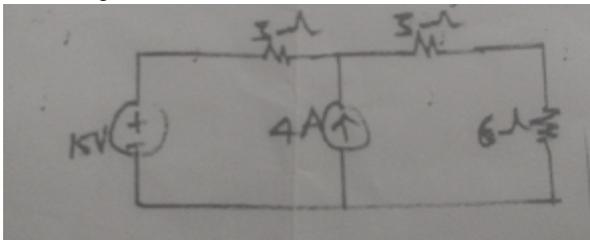
0. Solve for current in 5 ohm resistor by super position theorem.



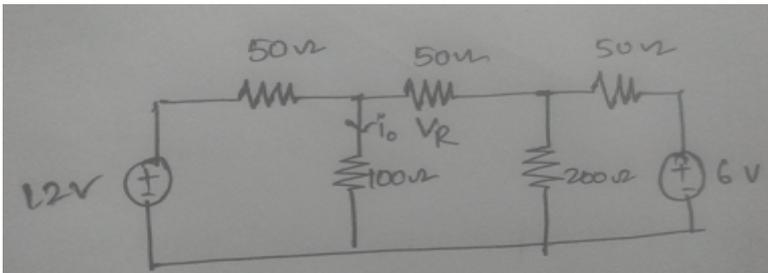
0. Determine the current flowing through the 4 ohm resistor in the below circuit by mesh analysis.



0. Write the procedure for solving circuit using Norton's theorem and calculate current through 6 ohm resistor in the circuit shown below by Norton's equivalent.



0. Use nodal analysis to determine i_0 and V_R



UNIT-II- AC Circuits

Short Answer Questions

1. Derive the expression for RMS and Average value of Sine wave.
2. Define form factor and Peak factor.
3. Define Phase and Phase difference of alternating quantities.
4. Draw the phasor diagram for AC through pure resistor, pure inductor and pure capacitor.
5. Write the voltage and current relationships in a three phase circuits for star connected load and Delta Connected load. What do you mean by 3-Phase balanced load.
6. Define Active, Reactive and Apparent power in AC circuits . What do you understand by Balanced loads.
7. A balanced star connected load of $(8+j6)$ ohms per phase is connected to a balanced three phase 400V Supply. Find the line currents.
8. A series circuit having the $R=15$ ohm and $X_L=20$ ohm. Determine the power factor for the circuit.
9. Define Power factor. What are disadvantages of low Power Factor?
10. The input to 3-phase induction motor is read by two wattmeters. The readings are 1000W and 250W respectively. Calculate the power factor of the motor.

Long Answer Questions

1. Explain the operation of a series RLC circuit, when excited by AC supply with neat diagram
2. Explain the two wattmeter method with neat diagram? And draw the phasor diagram.
3. A series RLC circuit consisting of a resistance of 20 ohm, and inductance of 0.2H, and a capacitance of $150\mu\text{F}$ is connected across a 400V, 50HZ source. Calculate (a) Impedance (b) current (c) Voltage drops V_R , V_L and V_C (d) Power Factor (e) Average power.

4. Derive the voltage and current relations in star and delta connected systems.
5. A 220V, $1-\phi$, 50 HZ supply is applied across series connection of $R=10\ \text{ohm}$, $L=0.05\text{H}$. Calculate impedance, current, V_R , V_L and V_C , Power Factor, Active power and Reactive Power.
6. A series RLC circuit consisting of a resistance of 10 ohm, and inductance of 0.05H, and a capacitance of $300\mu\text{F}$ is connected across a 100V, 50HZ source. Calculate (a) Impedance (b) current (c) Voltage drops V_R , V_L and V_C (d) Power Factor (e) Average power.
7. A series RLC circuit consisting of a resistance of 10 ohm, and inductance of 0.2H, and a capacitance of $300\mu\text{F}$ is connected across a 100V, Calculate magnitude and phase angle of current when the frequency is (a) 25 Hz and (b) 50 Hz
8. a) An Alternating Current is given by $i=141.4\ \text{Sin}\ 314t$. Find Maximum value and frequency.
b) What are the three cases which arrives due to difference in reactances of RLC Circuit.
9. Derive the expression for Current, power factor and power in Series R-L circuit
10. Derive the expression for Current, power factor and power in Series R-C circuit.
11. Derive the expression for Current, power factor and power in Series R-L-C circuit
12. A balanced delta connected load of $(12+j9)\text{ohm}$ per phase is connected to 3-Phase, 400V supply. Find line current, Power factor, power drawn, Reactive volt amperes and Total volt amperes.
13. The impedance of an electrical circuit is $30-j0$ ohms. Determine (i) the resistance (ii) the capacitance and (iii) the magnitude of the impedance, when the circuit is connected to a 240V, 50Hz supply.

Unit-III

Short answer questions

1. What is dynamically induced emf and statistically induced emf?. Write the relation between turns ratio, voltage ratio and current ratios in transformer.
2. Explain Faraday's laws and Lenz's law. What is magnetic hysteresis explain with the help of B-H curve.
3. Will the transformer draw any current from source when the secondary open circuited? Explain why transformer rating is in KVA.
4. Name the losses in Transformer. A 100KVA transformer operating at full load at 0.8 pf lagging. Its efficiency is 96% calculate total losses in transformer.
5. Write short notes on Auto transformer.
6. Write short notes on Open circuit and Short circuit tests on Transformer. Draw no load phasor diagram of single phase transformer.
7. Define slip. Mention various applications of three phase induction motor.
8. A 6 pole, 3-phase induction motor is connected to 50Hz supply. If it is running at 970 rpm, find the slip.
9. Compare squirrel cage and slip ring induction motor. Draw the schematic diagram of a star-delta starter for a three phase induction motor.

Long answer questions

1. Explain principle of operation of transformer on no load.
2. Explain in detail about the ideal and practical transformer and draw its phasor diagram.
3. In a 25 KVA 2000/200V transformer the iron and copper losses are 350w and 400W respectively. Calculate the efficiency on unity power factor at a) full load b) half load.
4. Derive emf equation of single phase transformer. Draw the exact equivalent circuit of transformer.
5. a) Explain how rotating magnetic field is produced in three phase induction motor.
b) Explain working principle of 3-phase Induction motor.
6. A 18.65 KW, 4 pole, 50 Hz, three phase induction motor has friction and windage losses of 2.6% of the output and full load slip is 4.2%. Find the following
i) the rotor copper loss ii) the rotor input iii) the output torque iv) the gross mechanical torque developed in the rotor.
7. A 200 KVA, 1-Phase, 50Hz, 2000/440V transformer gave the following test results:
OC test: 2000V, 1.8a, 1.75KWon HV side
SC test: 13V, 300A, 1KWon LV side
Obtain the equivalent circuit parameters as referred to HV side.
8. a) Why starter required for 3-phase induction motor and explain any one starting method for 3-phase induction motor with a neat diagram.
b) Draw and explain Torque- Speed curve for 3-phase Induction motor.
9. A 20 KVA, 1-phase, 50Hz 2200/220V transformer gave the following test results:
OC test: 2200V applied to primary, power taken 220W
SC test: Power required circulating full load current in short circuited secondary 240W. Calculate the efficiency at full load and half load at pf 0.8 lagging.
10. Derive the condition for maximum efficiency of transformer and draw efficiency curve?
11. a) A 3 KVA, 1-phase, 50Hz 230/115V transformer gave the following test results
OC test: 115V, 0.6A, 10W
SC test: 60V, 13A, 200W
Calculate efficiency at full load and half load at pf 0.8 lagging
b) Explain the construction of three phase Induction motor.

Unit-IV

Short answer questions

1. List out essential Parts of DC Machine
2. What is the function of armature coils?
3. Mention the losses in DC machine.
4. Write down the similarities between motors and generators.
5. Write the advantages, disadvantages and application of two value capacitor run motor.
6. Draw the connection diagram of capacitor-start single phase induction motor.
7. Classify D.C generators based on their field excitations.
8. An 6 pole lap wound armature has 1200 conductors and flux per pole of 0.02 wb. Determine the generated emf when
9. running at 600 rpm.
10. How are the 1-phase induction motor made self starting?
11. Classify different types of single phase induction motor.
12. Mention various applications of a D.C series motor and DC generators.
13. What are the essential components of battery backup.

Long Answer Questions

1. Explain the construction and features and principle of operation of single phase induction motor.
2. What is the principle operation of DC generator? Derive the e.m.f equation of a D.C generator.
3. Describe the construction of a D.C generator and write the functions of each part with neat sketch.
4. Classify the generators based on excitation. Draw the figure and write the current, voltage equation for each configuration.
5. Draw the internal and external characteristics of different types of DC generators and explain them.
6. Name different types of D.C motors and state their application.
7. How will you distinguish between series and shunt windings of a d.c compound machine?
8. Classify and Draw different types of DC motors .Give the power, voltage and current equations for different types of D.C motors.
9. Explain the principle of operation of capacitor start induction motor.
10. What is the principle operation of DC motor? Explain the significance of back E.M.F. Derive torque equation of DC motor.
11. Explain briefly about capacitor start and capacitor run 1 phase induction motor.
12. Which type of motor is used for following applications
a)Sewing Machine b) mixer c)dishwasher d) washing machine.
13. A 4 pole, lap wound DC shunt generator has a useful flux per pole of 0.07wb. The armature winding consists of 440 conductors and the armature resistance of 0.055ohm. calculate the terminal voltage when running at 900 rpm. If the armature current is 50A.

UNIT-V

Short answer Questions

1. State the factors on which the choice of wiring system depends.
2. Classify the different UPS.
3. Classify the cables according to voltage grading.
4. Differentiate between primary and secondary cells.
5. Mention the desirable properties of fuse element.
6. Why a consumer having low p.f is charged at higher rates?
7. Write the essential components of battery backup.
8. List out the characteristics of battery.
9. What is a fuse?.
10. What is meant by earthing?
11. What is Miniature Circuit Breaker?

Long Answer Questions

1. What is the significance of Circuit breaker?.Explain construction and working of MCB,ELCB and MCCB.
2. What is miniature circuit breaker and mention its use? Give the specifications of miniature circuit breaker.
3. With a block diagram, explain the working of online UPS.
4. What are batteries? How are they classified?. State some important characteristics of Batteries.
5. Write the uses of standard wire gauge.
6. What is earthing? What are the types of earthing?Explain about strip or wire earthing and rod earthing.

7. What is the importance of power factor?. Explain the disadvantages of low power factor. Explain the different methods to improve the power factor of the system.
8. Write the uses of standard wire gauge.
9. Explain about pipe earthing and plate earthing.
10. Explain different components of LT switch gear.
11. Write a short note on power factor improvement using static capacitors.
12. Explain what specifications for wires for domestic wiring are normally required. Describe different types of cables used for domestic wiring.
13. A consumer uses a 10KW gezer, a 6KW electric furnace and five 100W bulbs for 15 hours. How many units(KWH) of electrical energy have been used/ If the per unit charge (Kwh) is Rs 5.20. Find his electricity bill for 1 month.
14. In a house , there are 5 lamps 25Watts used 14 hours per day, a 200 Watt refrigerator used 24 hours per day and 125 watt water pump used 8 hours per day. How much electrical energy used for a month.

