

Multiple Choice Questions

Question

In a purely Inductive circuit, Voltagethe current by 90degrees.

- (A) lags
- (B) leads
- (C) Both A and B
- (D) None

Explanation

Question

Power factor in series RLC is given by

- (A) $\cos(\text{angle between } V \text{ and } I)$
- (B) Realpower/Apparent power
- (C) R/Z
- (D) All the above

Question

At resonance, In series RLC circuit, the current passing through the resistor is.....

- (A) Maximum
- (B) Minimum
- (C) Medium
- (D) 1

Question

Reactive power in a circuit is given by.....

- (A) $V I \cos \phi$
- (B) $V I \sin \phi$
- (C) VI
- (D) None

Question

Power factor of an RC circuit is

- (A) Lies between 0 and 1
- (B) Negative value
- (C) zero
- (D) Unity

Question

The frequency at which Inductive reactance X_L is equal to Capacitive reactance X_C is known as.....

- (A) Indian star frequency
- (B) PK Frequency
- (C) Resonant frequency
- (D) Power star frequency

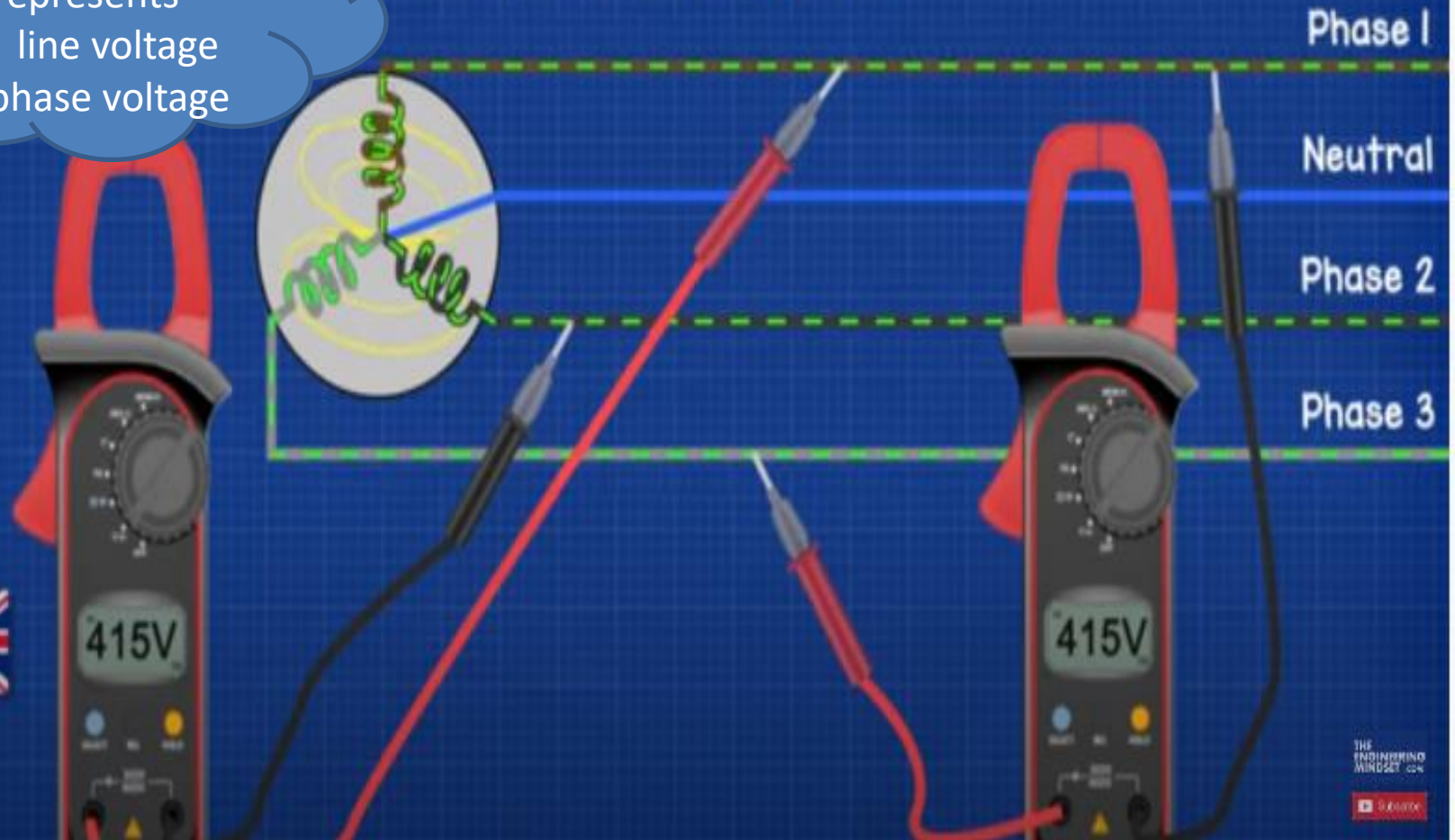
Three Phase Electricity

Basics & Calculations



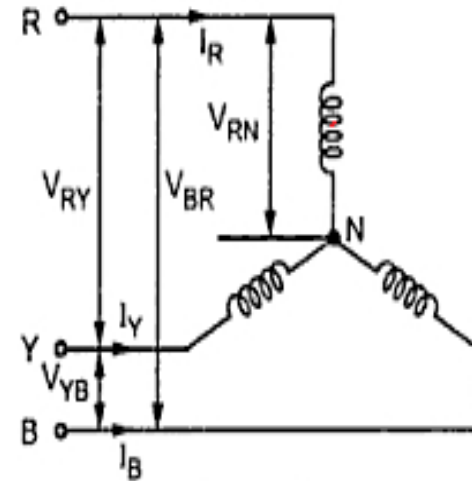
POLL: Figure represents

- A) line voltage
- B) phase voltage



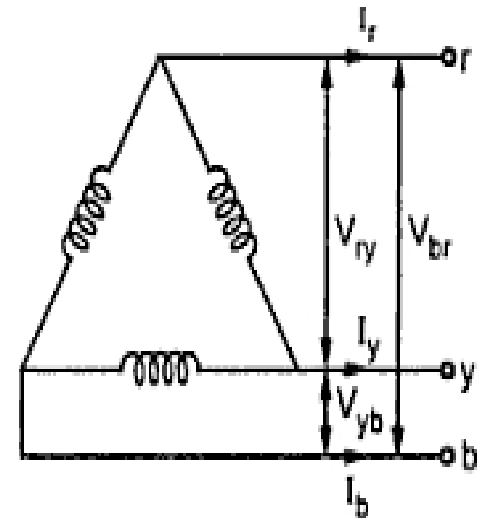
Summary (Star Connection)

- $I_L = I_{ph}$
- $V_L = \sqrt{3}V_{ph}$
- $P = 3V_{ph}I_{ph} \cos \phi = \sqrt{3}V_L I_L \cos \phi$



Summary (Delta Connection)

- $V_L = V_{ph}$
- $I_L = \sqrt{3}I_{ph}$
- $P = 3V_{ph}I_{ph} \cos \phi = \sqrt{3}V_L I_L \cos \phi$



Question

A transformer

- (A) changes ac to dc
- (B) changes dc to ac
- (C) steps up or step down dc voltages
- (D) steps up or down ac voltages

Question

Transformer rating will be in.....

- (A) k VA
- (B) k W
- (C) k VAR
- (D) None

Question

The primary and secondary winding of transformer are linked each other by

- (A) Conduction
- (B) Mutual induction
- (C) Both a and b
- (D) None

Question

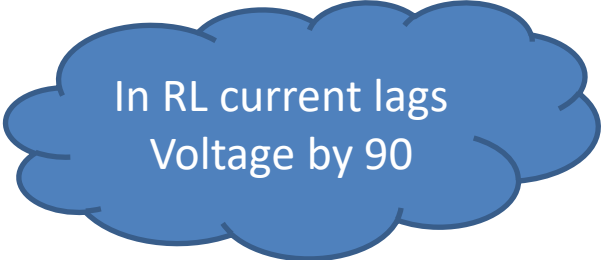
What is the capacitive reactance of a $1\ \mu\text{F}$ Farad capacitance at 60Hz?

- (A) 2.652
- (B) 2652
- (C) 2652 F
- (D) 2652 kF

Question

The phase angle of series RLC circuit is lagging if

- (A) $X_L > X_C$
- (B) $X_L < X_C$
- (C) $X_L = X_C$
- (D) None



In RL current lags
Voltage by 90

Answer

- A

Question

- The voltage applied across an RL circuit is equal to.....of V_R and V_L .
- (A) arithmetic sum
- (B) algebraic sum
- (C) phasor sum
- (D) sum of the squares

Question

- In a certain loaded transformer, the secondary voltage is one-fourth the primary voltage. The secondary current is
- (A) one-fourth the primary current
- (B) four times the primary current
- (C) equal to primary current
- (D) none

Answer

- B

Question

- Oil is provided in an oil filled transformer for....
- (A) cooling
- (B) Insulation
- (C) Both a and b
- (D) None

Answer

- C

Question

- Lamination of transformer core is made of
- (A) cast iron
- (B) cast steel
- (C) silicon steel
- (D) None

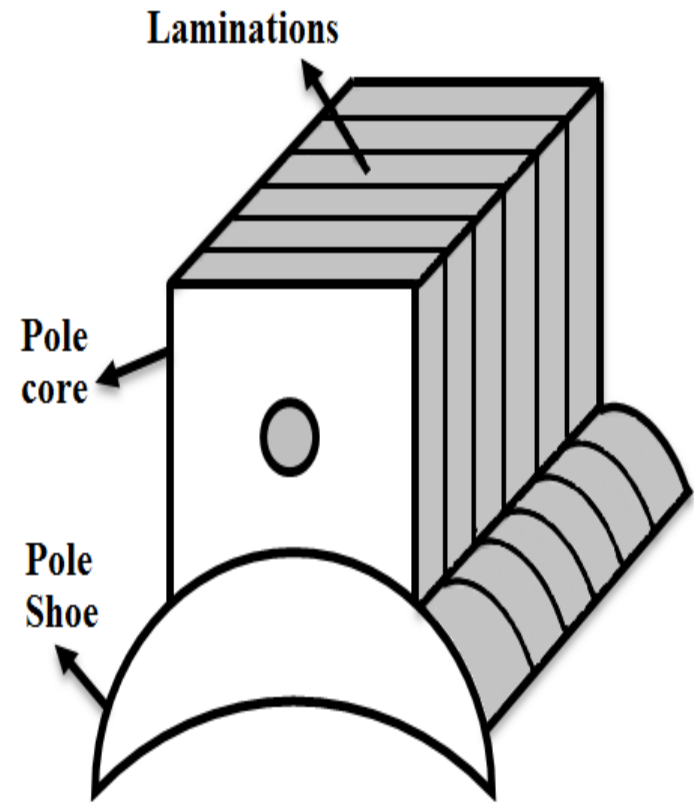
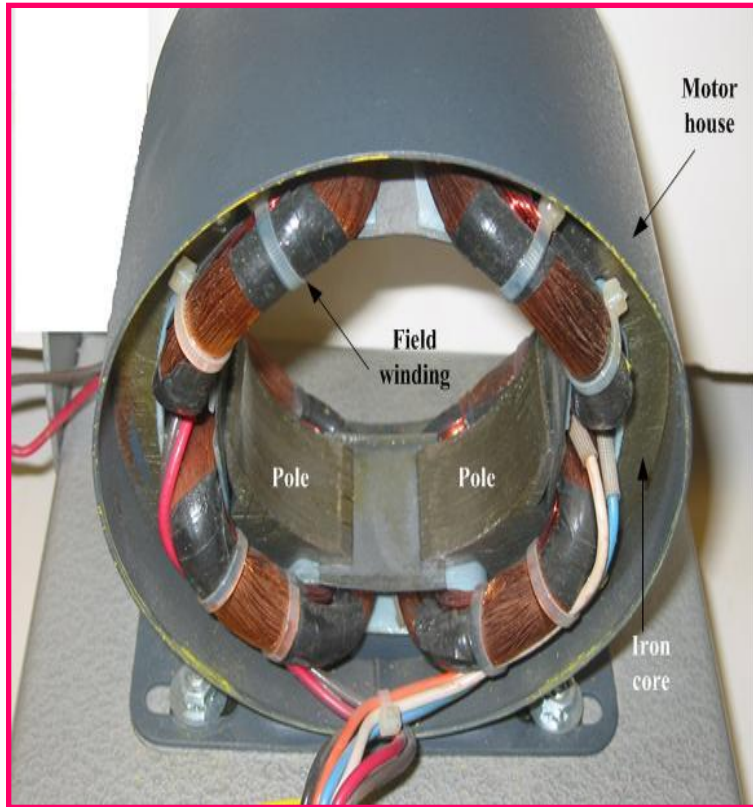
Question

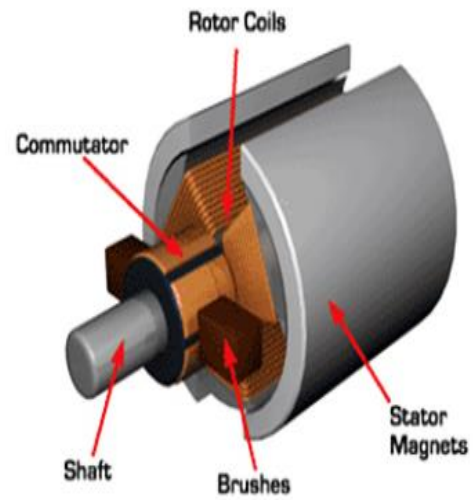
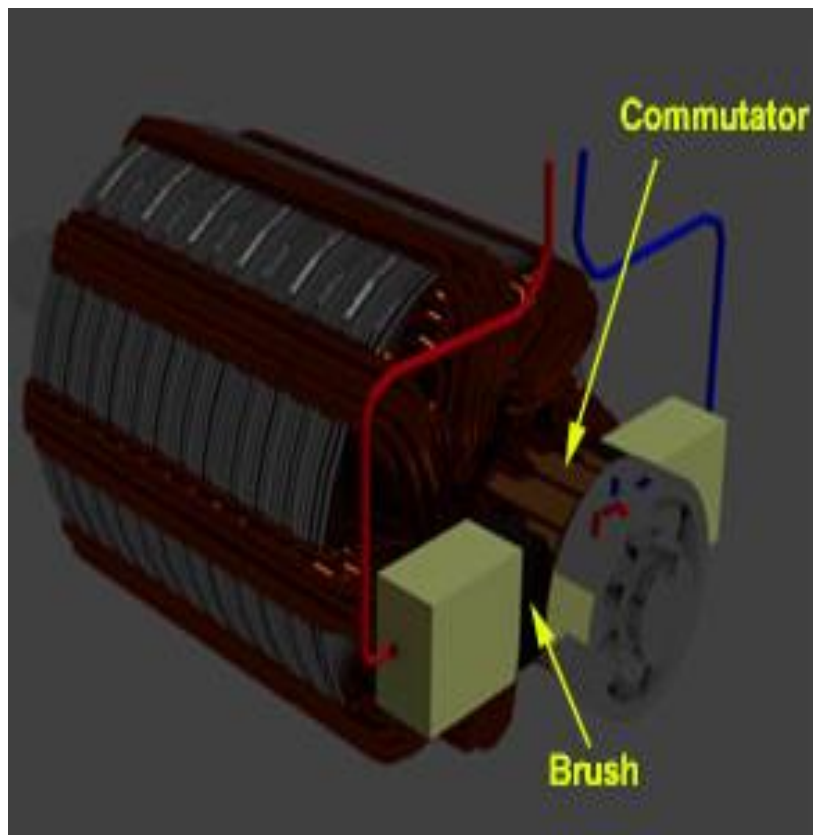
A dc motor is a device which converts energy into.....energy.

- (A) Electrical, Mechanical
- (B) class, Mass
- (C) Mechanical, Electrical
- (D) Mass, class

Question

-provides mechanical support for the poles and acts as a protecting cover for the whole DC machine.
- (A) Yoke
- (B) Brushes
- (C) Magnets
- (D) commutator





Question

.....converts the alternating current induced in the armature conductors into unidirectional current in the external load circuit.

- (A) Yoke
- (B) Brushes
- (C) Magnets
- (D) commutator

Question

-function is to collect current from commutator
- (A) Yoke
- (B) Brushes
- (C) Magnets
- (D) commutator

Question

- Brushes are made up of usually.....
- (A) Carbon
- (B) Graphite
- (C) Either a or b
- (D) None

Question

- DC shunt motor isspeed motor.
- (A) Constant
- (B) Variable
- (C) Either a or b
- (D) None

Answer

- A

Question

- DC series motor is.....speed motor.
- (A) Constant
- (B) Variable
- (C) Either a or b
- (D) None

Answer

- B

Question

- Number of parallel paths for wave winding in DC motor is equal to.....
- (A) 2
- (B) Number of poles in dc motor
- (C) either a or b
- (D) None

Answer

- A



Mesh analysis

poll

If there are 5 branches and 4 nodes in graph, then the number of mesh equations that can be formed are?

- a) 2
- b) 4
- c) 6
- d) 8

Solution

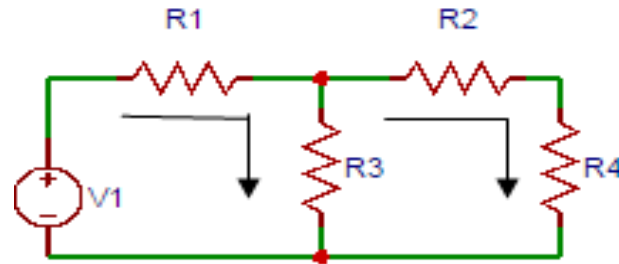
Number of mesh equations= $B-(N-1)$.

Given number of branches = 5 and number of nodes = 4. So Number of mesh equations = $5-(4-1) = 2$.

Poll

- Consider the circuit shown below. The number mesh equations that can be formed are?

- a) 1
- b) 2
- c) 3
- d) 4

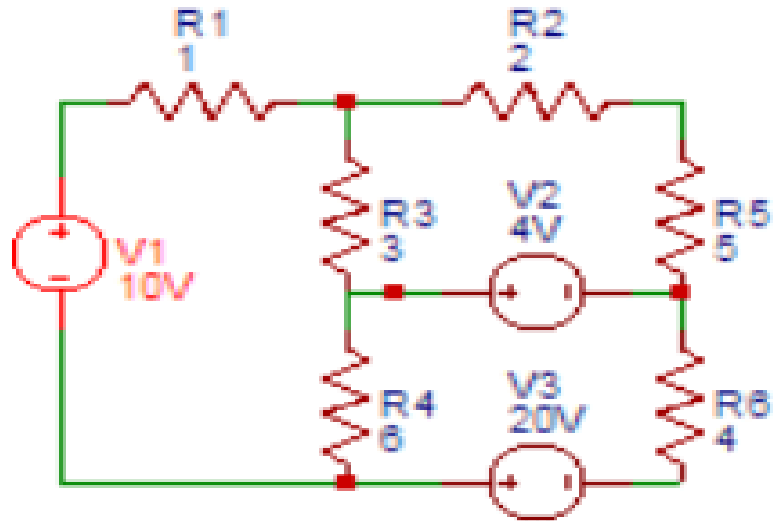


What is the current in R_3 ? If I_1 and I_2 are mesh current

Poll

Consider the circuit shown below. Find the current I_1 .

- a) 3.3
- b) 4.3
- c) 5.3
- d) 6.3



Solution

According to mesh analysis,

$$(1+3+6)I_1 - 3(I_2) - 6(I_3) = 10$$

$$-3(I_1) + (2+5+3)I_2 = 4$$

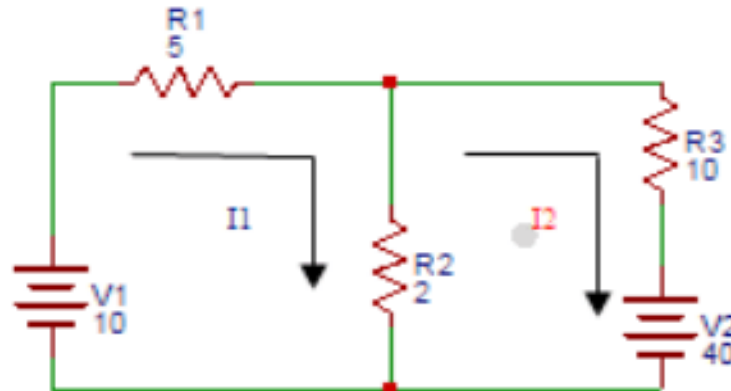
$$-6(I_1) + 10(I_3) = -4 + 20$$

On solving the above equations, $I_1 = 4.3\text{A}$.

Poll

Find current through R_2 resistor.

- a) 3
- b) 3.25
- c) 3.5
- d) 3.75



Solution

Applying mesh analysis,

$$10 - 5(I_1) - 2(I_1 - I_2) = 0.$$

$$40 - 10(I_2) + 2(I_2 - I_1) = 0.$$

On solving, $I_1 = 0.5\text{A}$, $I_2 = -3.25\text{A}$.

So current through R_2 resistor is $0.5 - (-3.25)$
 $= 3.75\text{ A}$.

Poll

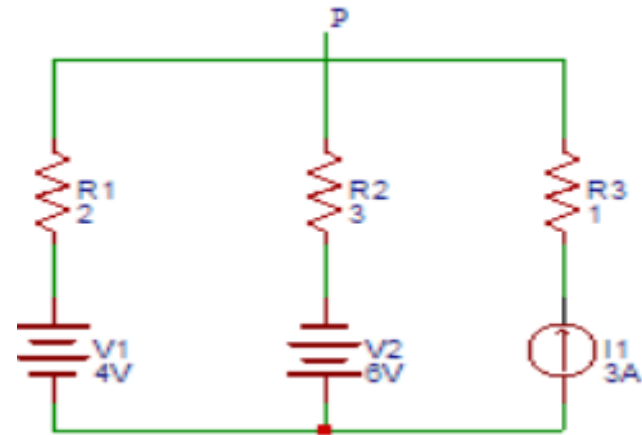
Find the voltage at node P in the figure shown.

a) $18/5V$

b) $9/5V$

c) $10V$

d) $11V$



The nodal equation at node P will be

$$I_1 + I_2 + 3 = 0$$

$$I_1 = (4 - V)/2 + I_2 = (-6 - V)/3 + 3 = 0.$$

On solving, $V = 18/5V$.

Poll

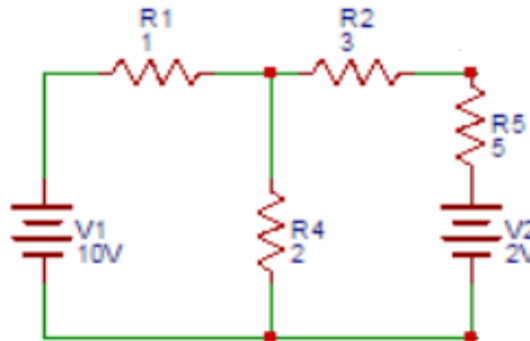
Find the voltage (V) at node in the circuit shown.

a) 5.3

b) 6.3

c) 7.32

d) 8.32



SOLUTION

At node 1, $(V_1 - 10)/1 + V_1/2 + (V_1 - 2)/8 = 0$

On solving above equations, we get

$$V_1 = 6.3V.$$

Explanation