#### AC Circuit MCQs: 81 to 85

#### 81 The average power loss in 50 µH pure inductance is

- (a)50 watt
- (b)500 watt
- (c)100 watt
- (d)Zero

Correct Answer (d): Zero

The power loss in the pure inductor is zero.

# Julgo.c 82 The charge across capacitor is given by

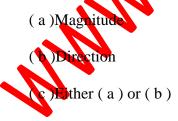
- ( a )IV
- (b)CV
- $(c)I^2R$
- $(d)V^2C$

Correct Answer (b): CV

The charge across capacitor  $Q/V^2 = Q$ )

(As 
$$Q = CV$$
 or  $C = Q / V$ 

The vector quantity is represented by 83



( d )Both ( a ) and ( b )

Correct Answer (d): Both (a) and (b)

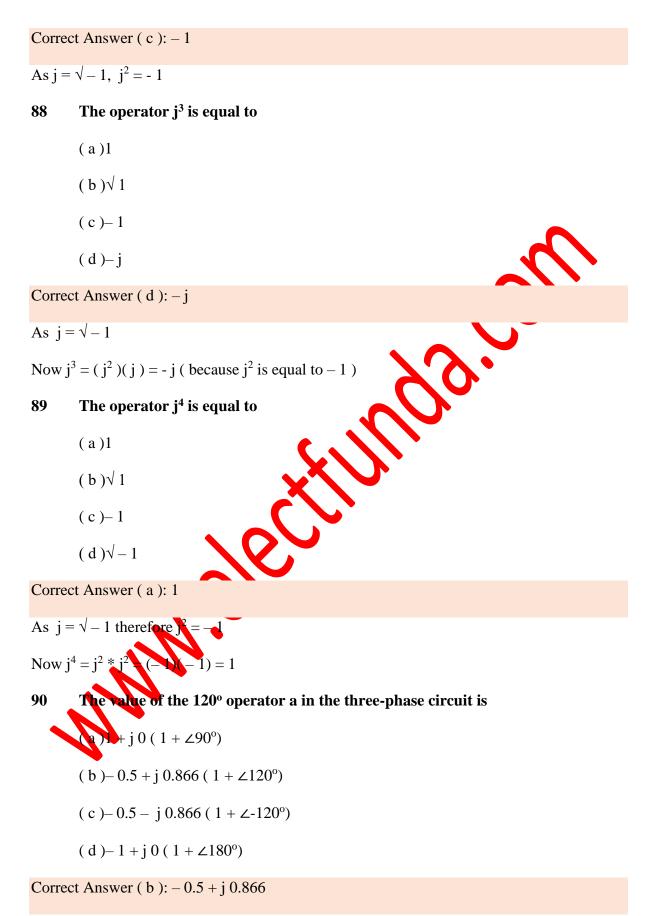
The vector is represented by both magnitude and direction whereas scaler is represented by

magnitude only.

#### The scalar quantity is represented by 84

(a)Magnitude (b)Direction (c)Either(a) or(b) (d)Both(a) and(b)Correct Answer ( a ): Magnitude The scaler is represented by magnitude only. 85 The symbol j represents anticlockwise rotation of vector quantity through ( a )0° (b)45° ( c )90° (d)180° Correct Answer ( c ): 90° The vector j is represented by anti-clockwise rotation of vector through 90 degree. AC Circuit MCQs: 86 to 90 The value of operator 86 (a)1 (b)√1 Correct Answer ( c ):  $\sqrt{-1}$ The operator j<sup>2</sup> is equal to 87 (a)1 (b)√1

- ( c )– 1
- ( d )–  $\sqrt{1}$



The value of operator a rotates in the anti-clockwise direction

 $a = 1 \angle 120^{\circ} = 1$  (Cos  $120^{\circ} + j Sin 120^{\circ}) = -0.5 + j 0.866$ 

More information About Operator j

## AC Circuit MCQs: 91 to 95

# 91 The value of the 120° operator a<sup>2</sup> in the three-phase circuit rotates in the clockwise direction by

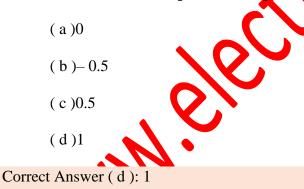
( a )120°

- (b)240°
- ( c )-120°
- ( d )0°

Correct Answer ( a ): 120°

The value of operator a rotates in the anti-clockwise direction, a means operated rotates 240 degree in the anticlockwise direction or 120 degree in the clockwise direction.

92 The value of three phase 120° operator a



The operator  $a^{1} = 1 \angle 360^{\circ} = 1$  ( Cos  $360^{\circ} + j \operatorname{Sin} 360^{\circ}$ ) = 1 + j 0 = 1

93 The value of three phase 120° operator a<sup>2</sup> is

- (a)-0.5 + j 0.866
- ( b ) 0.5 + j 0.866
- ( c )-0.5 j 0.866
- (d)None of the above

Correct Answer ( c ): -0.5 - j 0.866

The operator  $a^2 = 1 \angle 240^\circ = 1$  ( Cos 240° + j Sin 240°) = -0.5 - j 0.866

## 94 Which of the following relation is true for the three-phase circuit operator a?

$$(a)a^{2} + a = -1$$
  
 $(b)a^{2} + a = 0$   
 $(c)a^{2} + a = 1$   
 $(d)a^{2} + a = a$ 

Correct Answer (a):  $a^2 + a = -1$ 

We have to prove that  $a^2 + a = -1$ 

Now

$$a^2 = 1 \ \angle 240^\circ = 1$$
 ( Cos 240° + j Sin 240° ) =  $-0.5 - j \ 0.866$  and

- a = 1 ∠120° = 1 (Cos 120° + j Sin 120°) = -0.5 + j 0.866L.H.S. = a<sup>2</sup>+ a = (-0.5 - j 0.866) + (-0.5 + j 0.866) = -1.0
- 95 Which of the following relation is true for the three phase 120° operator?

(a) $a^{3} + a^{2} + a = 1$ (b) $a^{3} + a^{2} + a = (-1)$ (c) $a^{3} + a^{2} + a = \sqrt{(-1)}$ (d) $a^{3} + a^{2} + a = 0$ 

Correct Answer (d):  $a^{3}+a^{2}+a=0$ 

We have to prove that 
$$a^3 + a^2 + a = 0$$
  
Now

$$a^3 = 1 \angle 360^\circ = 1$$
 (Cos  $360^\circ + j \sin 360^\circ$ ) =  $1 + j 0 = 1$ 

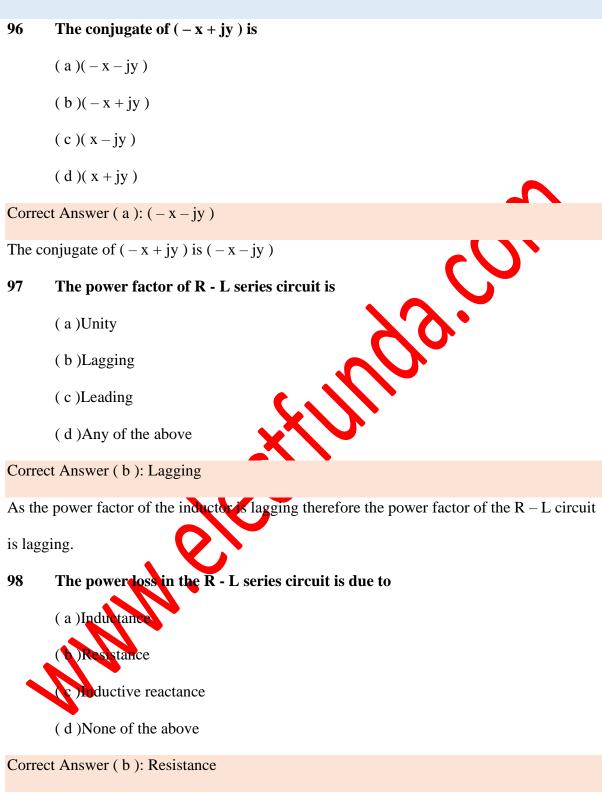
$$a^2 = 1 \angle 240^\circ = 1$$
 (Cos 240° + j Sin 240°) =  $-0.5 - j 0.866$  and

$$a = 1 \angle 120^{\circ} = 1$$
 ( Cos  $120^{\circ} + j Sin 120^{\circ}$  ) =  $-0.5 + j 0.866$ 

 $L.H.S = a^3 + a^2 + a$ 

 $= (1) + (-0.5 - j \ 0.866) + (-0.5 + j \ 0.866) = 0$ 

#### AC Circuit MCQs: 96 to 100



There is no power loss in the pure inductive circuit therefore power loss in the RL circuit is

only due to resistance of the circuit.

## 99 Which of the following is true for series RL circuit? $V_R = 3V$ , $V_L = 4V$ , then

(a)7.0 Volt (b)1.0 Volt (c).-1.0 Volt (d)5.0 Volt Correct Answer (d): 5.0 Volt The voltage vector in the RL Series OR RC Series circuit form Pythagorus therefore  $V = \sqrt{V_R^2 + V_L^2} = \sqrt{(3)^2 + (4)^2} = \sqrt{25} = 5.0 V$ 100 The power consumption in the series RL circuit (a)VI (b)VI Cos  $\Phi$ (c)VI Sin  $\Phi$ (d)Zero

Correct Answer ( b ): VI Cos  $\Phi$ 

The power consumption in the RL or RC or RLC circuit is equal to active power.

 $P = VI \cos \Phi$ 

supply voltage V is

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