AC Circuit MCQs: 101 to 105

101 The inductive reactance is given by

(a)ωC

(b)πfL

(c)2πfL

(d)L / 2πf

Correct Answer (c): 2πfL

The inductive reactance is given by $X_L = 2\pi fL$

102 The voltage vector _____ current vector in the series RL circuit.

(a)Leads

(b)Lags

(c)Is in phase with

(d)Any of the above

Correct Answer (b): Lags

The series RL circuit is inductive circuit due to presence of inductance L so it is lagging circuit.

103 The true power in the series R - L circuit is given by

(a)VI × Load factor

(b)VI × Power factor

(c)VI × Form factor

(d)None of the above

Correct Answer (b): VI × Power factor

The true power or useful power is given by VI × Power factor whereas the wattless component or reactive power is given by VI × Sin Φ.

104 The cosine of angle between voltage vector and current vector is known as

(a)Power factor

(b)Load factor

(c)Form factor

(d)Peak factor

Correct Answer (a): Power factor

The power factor is defined as the cosine of angle between voltage vector and current vector.

105 The ratio of true power to the apparent power is known as

(a)Power factor

(b)Load factor

(c)Form factor

(d)Peak factor

Correct Answer (a): Power factor

Power factor = VI Cos Φ / VI

= Active power / Apparent power

AC Circuit MCQs: 106 to 110

106 The power factor is a ratio of

(a)R / Z

(b)X / Z

(c)R^2 / Z

(d)Y / Z

Correct Answer (a): R / Z

If R, X and Z are component of triangle where Z = impedance of circuit, X = reactance of circuit and R = Resistance of circuit

Cos Φ = R / Z

107 The active power is better known as

(a)Idle component

(b)Wattless component

(c)Wattful component

(d)None of the above

Correct Answer (c): Wattful component

108 Which of the following component is responsible for power factor?

(a)VI

(b)VI Cos Φ

(c)VI Sin Φ

(d)VI tan Φ

Correct Answer (c): VI Sin Φ

The reactive power is responsible for power factor. If the reactive power increases, power factor decreases and vice versa. E.g.

Let Φ = 0 degree

Active power = VI Cos 0 = VI

Reactive power = VI Sin 0 = 0

Let Φ = 45 degree

Active power = VI Cos 45 = VI / √2

Reactive power = VI Sin 45 = VI / √2

Let Φ = 90 degree

Active power = VI Cos 90 = 0

Reactive power = VI Sin 45 = 1

From the above, as the reactive power increases, active power increases or power factor decreases considering product of VI remains constant.

109 The reactive power is better known as

(a)VI

(b)VI Cos Φ

(c)VI Sin Φ

(d)kVA

Correct Answer (c): VI Sin Φ

110 The product of the RMS voltage and RMS current is known as

(a)Reactive power

(b)Active power

(c)Apparent power

(d)Real power

Correct Answer (c): Apparent power

Active power = VI Cos Φ

Reactive power = VI Sin Φ

Apparent power = $\sqrt{}$ (active power)^2 + (Reactive power)^2 = VI

AC Circuit MCQs: 111 to 115

111 The power developed in the inductive reactance of the series R - L circuit is known as

(a)Apparent power

(b)Active power

(c)Reactive power

(d)DC power

Correct Answer (c): Reactive power

112 The power dissipated in the series R - L circuit is better known as

(a)Active power

(b)Reactive power

(c)Apparent power

(d)Idle power

Correct Answer (a): Active power

113 The reciprocal of the power factor is

(a)Load factor

(b)Real factor

(c)P - factor

(d)Q factor

Correct Answer (d): Q factor

Power factor Cos Φ = R/Z

Reciprocal of power factor is known as quality factor Q = Z/R

114 The Q factor of the series R - L circuit is

(a)X_L / R

(b)Z / R

(c)1 / R

(d)L / R

Correct Answer (b): Z / R

The impedance of series RL circuit Z = R + j X_L

Q factor of series RL / RC circuit is always Z/R

115 The current vector leads voltage vector in the series

(a)R - L circuit

(b)L - C circuit

(c)R - C circuit

(d)R - L - C circuit

Correct Answer (c): R - C circuit

The current leads voltage vector in the series RC circuit whereas it legs in the series RL circuit.

AC Circuit MCQs: 116 to 120

116 The power factor of the series R - C circuit is

(a)Unity

(b)Lagging

(c)Leading

(d)Zero

Correct Answer (c): Leading

Due to capacitance of the circuit, power factor is leading

117 The power factor of the series R - L - C circuit is

(a)Unity

(b)Lagging

(c)Leading

(d)Any of the above

Correct Answer (d): Any of the above

Two parameter affects the power factor of series RLC circuit: X_L and X_C

Inductive reactance = X_L

Capacitive reactance = X_C

If

$X_L > X_C$ = Inductive circuit, lagging power factor

$X_L < X_C$ = Capacitive circuit, leading power factor

$X_L = X_C$ = Resistive circuit, Unity, leading power factor

118 The net reactance of the series R - L - C circuit is

(a)R

(b)$X_L + X_C$

(c)$X_L \sim X_C$

(d)$X_L - X_C$

Correct Answer (c): $X_L \sim X_C$

Net reactance of series RLC circuit is $X_L \sim X_C$

$X_L > X_C$ = Inductive circuit, lagging power factor

$X_L < X_C$ = Capacitive circuit, leading power factor

119 The current leads voltage in the series R - L - C circuit when

(a)$X_L = X_C$

(b)$X_L > X_C$

(c)$X_C > X_L$

(d)R = 0

Correct Answer (c): $X_C > X_L$

Current leads voltage vector means capacitive circuit so $X_C > X_L$

If current legs voltage vector, inductive circuit so $X_L > X_C$

120 The voltage leads current in the series R - L - C circuit when

(a)Z = 0

(b)$X_L = X_C$

(c)$X_C > X_L$

(d)$X_L > X_C$

Correct Answer (d): $X_L > X_C$

Voltage leads current, it means that current lagging therefore it is inductive circuit. In the inductive circuit, $X_L > X_C$

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