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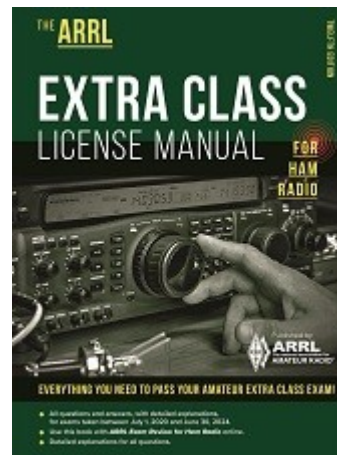
All You Need to Pass Your Extra Class Exam

LEVEL 3: Extra

For use with *The ARRL Extra Class License Manual,* 12th Edition

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What is the result of skin effect?

A. As frequency increases, RF current flows in a thinner layer of the conductor, closer to the surface

B. As frequency decreases, RF current flows in a thinner layer of the conductor, closer to the surface

C. Thermal effects on the surface of the conductor increase the impedance

D. Thermal effects on the surface of the conductor decrease the impedance

E5D01 ECLM Page (4 - 33)

What is the result of skin effect?

A. As frequency increases, RF current flows in a thinner layer of the conductor, closer to the surface

B. As frequency decreases, RF current flows in a thinner layer of the conductor, closer to the surface

C. Thermal effects on the surface of the conductor increase the impedance

D. Thermal effects on the surface of the conductor decrease the impedance

(A) E5D01 ECLM Page (4 - 33)

Why is it important to keep lead lengths short for components used in circuits for VHF and above?

A. To increase the thermal time constant

B. To avoid unwanted inductive reactance

C. To maintain component lifetime

D. All these choices are correct

E5D02 ECLM Page (4 - 35)

Why is it important to keep lead lengths short for components used in circuits for VHF and above?

A. To increase the thermal time constant

B. To avoid unwanted inductive reactance

C. To maintain component lifetime

D. All these choices are correct

(B) E5D02 ECLM Page (4 - 35)

What is microstrip?

A. Lightweight transmission line made of common zip cord

B. Miniature coax used for low power applications

C. Short lengths of coax mounted on printed circuit boards to minimize time delay between microwave circuits

D. Precision printed circuit conductors above a ground plane that provide constant impedance interconnects at microwave frequencies

E5D03 ECLM Page (5 - 13)

What is microstrip?

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(D) E5D03 ECLM Page (5 - 13)

Why are short connections used at microwave frequencies?

A. To increase neutralizing resistance

B. To reduce phase shift along the connection

C. To increase compensating capacitance

D. To reduce noise figure

E5D04 ECLM Page (4 - 35)

Why are short connections used at microwave frequencies?

A. To increase neutralizing resistance

B. To reduce phase shift along the connection

C. To increase compensating capacitance

D. To reduce noise figure

(B) E5D04 ECLM Page (4 - 35)

What is the power factor of an RL circuit having a 30 degree phase angle between the voltage and the current?

A. 1.73

B. 0.5

C. 0.866

D. 0.577

E5D05 ECLM Page (4 - 26)

What is the power factor of an RL circuit having a 30 degree phase angle between the voltage and the current?

A. 1.73

B. 0.5

C. 0.866

D. 0.577

(C) E5D05 ECLM Page (4 - 26)

In what direction is the magnetic field oriented about a conductor in relation to the direction of electron flow?

A. In the same direction as the current

B. In a direction opposite to the current

C. In all directions; omni-directional

D. In a circle around the conductor

E5D06 ECLM Page (4 - 7)

In what direction is the magnetic field oriented about a conductor in relation to the direction of electron flow?

A. In the same direction as the current

B. In a direction opposite to the current

C. In all directions; omni-directional

D. In a circle around the conductor

(D) E5D06 ECLM Page (4 - 7)

How many watts are consumed in a circuit having a power factor of 0.71 if the apparent power is 500 VA?

A. 704 W

B. 355 W

C. 252 W

D. 1.42 mW

E5D07 ECLM Page (4 - 26)

How many watts are consumed in a circuit having a power factor of 0.71 if the apparent power is 500 VA?

A. 704 W

B. 355 W

C. 252 W

D. 1.42 mW

(B) E5D07 ECLM Page (4 - 26)

How many watts are consumed in a circuit having a power factor of 0.6 if the input is 200 VAC at 5 amperes?

A. 200 watts

B. 1000 watts

C. 1600 watts

D. 600 watts

E5D08 ECLM Page (4 - 26)

How many watts are consumed in a circuit having a power factor of 0.6 if the input is 200 VAC at 5 amperes?

A. 200 watts

B. 1000 watts

C. 1600 watts

D. 600 watts

(D) E5D08 ECLM Page (4 - 26)

What happens to reactive power in an AC circuit that has both ideal inductors and ideal capacitors?

A. It is dissipated as heat in the circuit

B. It is repeatedly exchanged between the associated magnetic and electric fields, but is not dissipated

C. It is dissipated as kinetic energy in the circuit

D. It is dissipated in the formation of inductive and capacitive fields

E5D09 ECLM Page (4 - 24)

What happens to reactive power in an AC circuit that has both ideal inductors and ideal capacitors?

A. It is dissipated as heat in the circuit

B. It is repeatedly exchanged between the associated magnetic and electric fields, but is not dissipated

C. It is dissipated as kinetic energy in the circuit

D. It is dissipated in the formation of inductive and capacitive fields

(B) E5D09 ECLM Page (4 - 24)

How can the true power be determined in an AC circuit where the voltage and current are out of phase?

A. By multiplying the apparent power by the power factor

B. By dividing the reactive power by the power factor

C. By dividing the apparent power by the power factor

D. By multiplying the reactive power by the power factor

E5D10 ECLM Page (4 - 25)

How can the true power be determined in an AC circuit where the voltage and current are out of phase?

A. By multiplying the apparent power by the power factor

B. By dividing the reactive power by the power factor

C. By dividing the apparent power by the power factor

D. By multiplying the reactive power by the power factor

(A) E5D10 ECLM Page (4 - 25)

What is the power factor of an RL circuit having a 60-degree phase angle between the voltage and the current?

A. 1.414

B. 0.866

C. 0.5

D. 1.73

E5D11 ECLM Page (4 - 26)

How many watts are consumed in a circuit having a power factor of 0.2 if the input is 100 VAC at 4 amperes?

A. 400 watts

B. 80 watts

C. 2000 watts

D. 50 watts

E5D12 ECLM Page (4 - 26)

How many watts are consumed in a circuit having a power factor of 0.2 if the input is 100 VAC at 4 amperes?

A. 400 watts

B. 80 watts

C. 2000 watts

D. 50 watts

(B) E5D12 ECLM Page (4 - 26)

How many watts are consumed in a circuit consisting of a 100-ohm resistor in series with a 100-ohm inductive reactance drawing 1 ampere?

A. 70.7 watts

B. 100 watts

C. 141.4 watts

D. 200 watts

E5D13 ECLM Page (4 - 26)

How many watts are consumed in a circuit consisting of a 100-ohm resistor in series with a 100-ohm inductive reactance drawing 1 ampere?

A. 70.7 watts

B. 100 watts

C. 141.4 watts

D. 200 watts

(B) E5D13 ECLM Page (4 - 26)

What is reactive power?

A. Wattless, nonproductive power

B. Power consumed in wire resistance in an inductor

C. Power lost because of capacitor leakage

D. Power consumed in circuit Q

E5D14 ECLM Page (4 - 24)

What is reactive power?

A. Wattless, nonproductive power

B. Power consumed in wire resistance in an inductor

C. Power lost because of capacitor leakage

D. Power consumed in circuit Q

(A) E5D14 ECLM Page (4 - 24)

What is the power factor of an RL circuit having a 45 degree phase angle between the voltage and the current?

A. 0.866

B. 1.0

C. 0.5

D. 0.707

E5D15 ECLM Page (4 - 26)

What is the power factor of an RL circuit having a 45 degree phase angle between the voltage and the current?

A. 0.866

B. 1.0

C. 0.5

D. 0.707

(D) E5D15 ECLM Page (4 - 26)