

Section 6-5

G4E08 (A)

What is the name of the process by which sunlight is changed directly into electricity?

- A. Photovoltaic conversion
- B. Photon emission
- C. Photosynthesis
- D. Photon decomposition

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G4E09 (B)

What is the approximate open-circuit voltage from a fully illuminated silicon photovoltaic cell?

- A. 0.02 VDC
- B. 0.5 VDC
- C. 0.2 VDC
- D. 1.38 VDC

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G4E10 (B)

What is the reason that a series diode is connected between a solar panel and a storage battery that is being charged by the panel?

- A. The diode serves to regulate the charging voltage to prevent overcharge
- B. The diode prevents self-discharge of the battery through the panel during times of low or no illumination
- C. The diode limits the current flowing from the panel to a safe value
- D. The diode greatly increases the efficiency during times of high illumination

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G4E11 (C)

Which of the following is a disadvantage of using wind as the primary source of power for an emergency station?

- A. The conversion efficiency from mechanical energy to electrical energy is less than 2 percent
- B. The voltage and current ratings of such systems are not compatible with amateur equipment
- C. A large energy storage system is needed to supply power when the wind is not blowing
- D. All these choices are correct

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G5C01 (C)

What causes a voltage to appear across the secondary winding of a transformer when an AC voltage source is connected across its primary winding?

- A. Capacitive coupling
- B. Displacement current coupling
- C. Mutual inductance
- D. Mutual capacitance

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G5C02 (A)

What happens if a signal is applied to the secondary winding of a 4:1 voltage step-down transformer instead of the primary winding?

- A. The output voltage is multiplied by 4
- B. The output voltage is divided by 4
- C. Additional resistance must be added in series with the primary to prevent overload
- D. Additional resistance must be added in parallel with the secondary to prevent overload

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G5C06 (C)

What is the RMS voltage across a 500-turn secondary winding in a transformer if the 2250-turn primary is connected to 120 VAC?

- A. 2370 volts
- B. 540 volts
- C. 26.7 volts
- D. 5.9 volts

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G5C07 (A)

What is the turns ratio of a transformer used to match an audio amplifier having 600 ohm output impedance to a speaker having 4 ohm impedance?

- A. 12.2 to 1
- B. 24.4 to 1
- C. 150 to 1
- D. 300 to 1

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G5C16 (B)

Why is the conductor of the primary winding of many voltage step-up transformers larger in diameter than the conductor of the secondary winding?

- A. To improve the coupling between the primary and secondary
- B. To accommodate the higher current of the primary
- C. To prevent parasitic oscillations due to resistive losses in the primary
- D. To ensure that the volume of the primary winding is equal to the volume of the secondary winding

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G6A01 (C)

What is the minimum allowable discharge voltage for maximum life of a standard 12 volt lead-acid battery?

- A. 6 volts
- B. 8.5 volts
- C. 10.5 volts
- D. 12 volts

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G6A02 (B)

What is an advantage of the low internal resistance of nickel-cadmium batteries?

- A. Long life
- B. High discharge current
- C. High voltage
- D. Rapid recharge

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G7A01 (B)

What useful feature does a power supply bleeder resistor provide?

- A. It acts as a fuse for excess voltage
- B. It ensures that the filter capacitors are discharged when power is removed
- C. It removes shock hazards from the induction coils
- D. It eliminates ground loop current

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G7A02 (D)

Which of the following components are used in a power supply filter network?

- A. Diodes
- B. Transformers and transducers
- C. Quartz crystals

D. Capacitors and inductors

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G7A03 (A)

Which type of rectifier circuit uses two diodes and a center-tapped transformer?

- A. Full-wave
- B. Full-wave bridge
- C. Half-wave
- D. Synchronous

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G7A04 (A)

What is an advantage of a half-wave rectifier in a power supply?

- A. Only one diode is required
- B. The ripple frequency is twice that of a full-wave rectifier
- C. More current can be drawn from the half-wave rectifier
- D. The output voltage is two times the peak output voltage of the transformer

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G7A05 (B)

What portion of the AC cycle is converted to DC by a half-wave rectifier?

- A. 90 degrees
- B. 180 degrees
- C. 270 degrees
- D. 360 degrees

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G7A06 (D)

What portion of the AC cycle is converted to DC by a full-wave rectifier?

- A. 90 degrees
- B. 180 degrees
- C. 270 degrees
- D. 360 degrees

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G7A07 (A)

What is the output waveform of an unfiltered full-wave rectifier connected to a resistive load?

- A. A series of DC pulses at twice the frequency of the AC input
- B. A series of DC pulses at the same frequency as the AC input
- C. A sine wave at half the frequency of the AC input
- D. A steady DC voltage

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G7A08(C)

Which of the following is an advantage of a switchmode power supply as compared to a linear power supply?

- A. Faster switching time makes higher output voltage possible
- B. Fewer circuit components are required
- C. High-frequency operation allows the use of smaller components
- D. All these choices are correct

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