

Chapter 6.0 Hamtronics
Section 6.5 Power Sources

G4E08 (A) p.222

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

G4E09 (B) p.222

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

G4E10 (B) p.222

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 though 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

G4E11 (C) p.223

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 of these choices are correct

G5A12 (B) p.224

What is one reason to use an impedance matching transformer?

- A. To minimize transmitter power output
- B. To maximize the transfer of power
- C. To reduce power supply ripple
- D. To minimize radiation resistance

G5C01 (C) p.214

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

G5C02 (A) p.216

What happens if you reverse the primary and secondary windings of a 4:1 voltage step down transformer?

- A. The secondary voltage becomes 4 times the primary voltage
- B. The transformer no longer functions as it is a unidirectional device
- 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

G5C06 (C) p.215

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

G5C07 (A) p.224

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

G5C16 (B) p.215

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 insure that the volume of the primary winding is equal to the volume of the secondary winding

G6A01 (C) p.220

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

G6A02 (B) p.221

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

G6A04 (D) p.221

When is it acceptable to recharge a carbon-zinc primary cell?

- A. As long as the voltage has not been allowed to drop below 1.0 volt
- B. When the cell is kept warm during the recharging period
- C. When a constant current charger is used
- D. Never

G7A01 (B) p.219

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

G7A02 (D) p.220

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

G7A03 (D) p.218

What is the peak-inverse-voltage across the rectifiers in a full-wave bridge power supply?

- A. One-quarter the normal output voltage of the power supply
- B. Half the normal output voltage of the power supply
- C. Double the normal peak output voltage of the power supply
- D. Equal to the normal peak output voltage of the power supply

G7A04 (D) p.216

What is the peak-inverse-voltage across the rectifier in a half-wave power supply?

- A. One-half the normal peak output voltage of the power supply
- B. One-half the normal output voltage of the power supply
- C. Equal to the normal output voltage of the power supply
- D. Two times the normal peak output voltage of the power supply

G7A05 (B) p.216

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

G7A06 (D) p.217

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

G7A07 (A) p.217

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

G7A08(C) p.220

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 of these choices are correct