

## KNOWLEDGE PROBE 3: PORTABLE POWER TECHNOLOGY

### Battery Charging

#### Learning Objectives

1. Select the correct charging method for battery types.
  2. Identify safety precautions to be used while charging batteries.
  3. Identify battery storage conditions.
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1. When charging a battery, current flows through it in the opposite direction than that when discharging the battery into a load.
    - a. True
    - b. False
  2. What limits the charging current when charging a lead acid cell?
    - a. Battery internal resistance
    - b. Battery voltage
    - c. Charging voltage
    - d. External resistor
  3. The typical charging voltage for a lead acid battery is
    - a. 10 volts
    - b. 12 volts
    - c. 13 volts
    - d. 14 volts
  4. Which batteries use the voltage charging method?
    - a. Lead acid
    - b. Lithium manganese dioxide
    - c. Nickel-cadmium
    - d. Nickel metal hydride
  5. Which batteries used the voltage charging method?
    - a. Lithium ion
    - b. Lithium manganese dioxide
    - c. Nickel Cadmium
    - d. Nickel Metal Hydride
  6. Which batteries use the constant current charging method?
    - a. Lithium ion
    - b. Lead acid
    - c. Lithium manganese dioxide
    - d. Nickel metal hydride



7. Which batteries use the constant current charging method?
  - a. Lead acid
  - b. Lithium ion
  - c. Lithium manganese dioxide
  - d. Nickel-cadmium
8. The basic rule for choosing a charger for a battery is
  - a. Charger type must match the battery type
  - b. Chargers must have a large enough current rating
  - c. Use a universal charger
  - d. Use any charger on any battery
9. A trickle charger is one that
  - a. Discharges the battery fully before recharging it
  - b. Only uses a small charge current
  - c. Provides a minimum charging voltage or current to offset self discharge
  - d. Takes a really long time to charge
10. In most chargers, the charging voltage, current and other factors are fully set by
  - a. A special battery charging integrated circuit
  - b. Automatically monitoring battery voltage and selecting the charge method.
  - c. The AC input voltage
  - d. The user
11. What factors are monitored by a charger as a battery is charged?
  - a. Current
  - b. Temperature
  - c. Voltage
  - d. All of the above
  - e. None of the above
12. Which of the following is NOT usually part of a power management IC?
  - a. DC-DC converters
  - b. Voltage regulators
  - c. Power amplifiers
  - d. Charging circuits
  - e. Timers