

Name: \_\_\_\_\_

Organization: \_\_\_\_\_

Date: \_\_\_\_\_

## International Transportation Learning Center

### Electric School Bus (ESB) Module #4

#### Charging Overview Test

**Circle the correct answer for each question or statement.**

- 1) In the context of battery charging, AC stands for:
  - a. Alternator Charging
  - b. Asynchronous Charging
  - c. Alternating Current
  - d. Alternative Charging
  
- 2) The primary types of batteries used in electric school buses are:
  - a. Lead-acid
  - b. Lithium-ion (Li-Ion) and Lithium Iron Phosphate (LFP)
  - c. Alkaline
  - d. Zinc-air
  
- 3) Ampere or Amp is the amount of electricity flowing through a wire. More Amps means more electricity is flowing, similar to the amount of water flowing through a pipe.
  - a. True
  - b. False
  
- 4) AC charging, sometimes called "Level 2", delivers electric power to the vehicle, which the vehicle then converts to DC.
  - a. True
  - b. False**
  
- 5) With DC charging, the charger itself converts AC power to DC before delivering to the vehicle's battery.
  - a. True
  - b. False
  
- 6) Which is **NOT** a characteristic of AC Charging:

*This content was developed by the National Renewable Energy Laboratory and International Transportation Learning Center funded by the Joint Office of Energy and Transportation for distribution.*

- a. Provides a slower charge due to the conversion of AC to DC power within the vehicle.
  - b. Best suited for applications where buses require a fast, more immediate charge
  - c. Best suited for smaller battery pack requirements because they require less charging time to reach full capacity
  - d. Best suited for shorter routes that consume less electrical energy.
- 7) Thoughtful charger planning requires:
- a. An analysis of vehicle miles driven
  - b. Vehicle charger port location
  - c. Utility integration and coordination
  - d. All of the above
- 8) It is a best practice to do any pre-conditioning (heating or cooling the bus battery and cabin) while the bus is plugged in to the charger.
- a. True
  - b. False
- 9) Interoperability testing ensures:
- a. Potential problems are revealed before real-world scenarios
  - b. Compatibility between chargers and the vehicles
  - c. Any software and firmware updates are installed in advance
  - d. All of the above
- 10) Which is **NOT** a characteristic of a Charge Management System (CMS):
- a. Automatically distributes electricity based on state of charge
  - b. Automatically delays charging to take advantage of less expensive energy rates
  - c. Automatically plugs and un-plugs the charger cable to the vehicle
  - d. Manages maximum power draw used by all chargers at specific times
- 11) SAE J1772 is a common North American standard for electric vehicle charging plugs and ports.
- a. True
  - b. False
- 12) Adapters are available to accommodate various charging ports and plugs.
- a. True
  - b. False
- 13) Which fire extinguisher is best suited for electrical equipment:
- a. Class A
  - b. Class B
  - c. Class C
  - d. Class D

14) PPE stands for:

- a. Protective Evacuation Exercise
- b. Personal Protective Equipment
- c. Pyrotechnic Prevention Equipment
- d. None of the above

15) The primary purpose of a lock-out tag-out (LOTO) procedure is to:

- a. Prevent equipment theft
- b. Prevent the unexpected energization or startup of machinery and equipment
- c. Prevent the charger from being plugged into the vehicle
- d. None of the above

## Answer Key

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