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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