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Continuing Education Course #089
Solar Power Part IV
Inspecting and Evaluating Systems

1. What two items will you definitely need to perform an inspection or test of a solar PV system?
 - a. A screwdriver and pliers
 - b. A screwdriver and flashlight
 - c. A rope and ladder
 - d. A voltmeter and DC ammeter
2. What is the first step for inspecting or evaluating a solar PV system?
 - a. Check the circuit breakers and fuses
 - b. Check the controller voltage readings
 - c. Take a quick tour of the solar system installation
 - d. Check the inverter's amp output
3. When a solar PV system is designed, **every** demand the end user has for power must be accounted for.
 - a. True
 - b. False
4. If the owner cannot locate the manufacturer's manuals of the system components, where can they be obtained?
 - a. From the users
 - b. From the internet
 - c. From the local building department
 - d. None of the above.
5. Why should you never use cheap voltmeters, ammeters, or multimeters?
 - a. Because they are not intended for low-voltage high-amperage use.
 - b. Because they are unreliable.
 - c. Because they are too difficult to read.
 - d. Because they won't test the diodes properly.
6. What time of day should you check a solar power system's performance?
 - a. In the morning.
 - b. About mid-day.
 - c. Late afternoon.
 - d. None of the above
7. What charge state would a battery bank with a 4,000 amp-hr rating have with an Amp-hour reading of 2,400?
 - a. Nearly full
 - b. Approaching a low state
 - c. Low
 - d. None of the above

8. A 24-volt battery array is considered fully charged at what voltage?
- a. 22.5 – 24.5 V
 - b. 24.6 – 26.5 V
 - c. 26.6 – 28.5 V
 - d. 28.6 - 29.6 V
9. What can the cumulative amp-hours reading on a monitor meter tell you about the system?
- a. The power consumption over a specific time period.
 - b. The peak power rate of consumption.
 - c. The time the peak power rate occurred.
 - d. None of the above
10. What does the Min Voltage reading tell you?
- a. The lowest battery voltage recorded since the meter was reset.
 - b. If the batteries are being over-discharged.
 - c. If the batteries were probably damaged and will need testing.
 - d. All of the above.
11. What impact can small shadows have on a solar panel?
- a. None
 - b. Minimal
 - c. Significant
 - d. Complete loss of power
12. To increase a solar array's voltage, the panels should be wired in _____.
- a. Parallel
 - b. Series
13. The Partial Panel Shading Test is used for what?
- a. Testing the temperature sensors.
 - b. Testing for Heat Fade issues.
 - c. Locating a solar panel power problem without having to disconnect any of the wiring.
 - d. None of the above.
14. Most of the time, a faulty solar panel is the result of _____.
- a. A loose or corroded connection.
 - b. A bad diode.
 - c. A defective solar panel.
 - d. A poor ground wire.
15. The voltage of a solar panel will _____ as the temperature increases?
- a. Decrease.
 - b. Increase.
 - c. Not change.
 - d. None of the above.
16. What is the best way to determine if heat fade is a problem?
- a. Cooling the panel by covering it with a towel.
 - b. Cooling the panel by spraying it with water.
 - c. Checking the current readings in the evening.
 - d. Checking the panel in the winter.

17. What is needed to test a diode?
- a. An ammeter.
 - b. An ohm meter.
 - c. A voltmeter.
 - d. Another diode.
18. Where is a good place to test the open-circuit voltages of solar panels wired in series?
- a. At the junction box on the back of the panel.
 - b. At the series' combiner box.
 - c. At the charge controller.
19. The three types of trackers are _____.
- a. Active, Chronological, Passive
 - b. Active, Passive, Photometric
 - c. Chronological, Passive, Photometric
 - d. Active, Chronological, Photometric
20. In the U.S., solar panels must face what direction?
- a. Magnetic South
 - b. True South
 - c. 10 degrees southeast
 - d. 10 degrees southwest
21. What is the reconnect voltage for a typical charge controller with 12 V lead-acid batteries at 77°F (25°C)?
- a. 11.5 V
 - b. 12.0 V
 - c. 12.5 V
 - d. 13.0 V
22. What is the easiest way to identify a flooded cell battery when setting the switches on a charge controller?
- a. The size of the battery posts.
 - b. The letters FLD stamped on the cover.
 - c. The battery caps for servicing.
 - d. None of the above
23. Old batteries that discharge too quickly could be caused by what?
- a. Sulfation of the battery.
 - b. Damage from over-discharge occurrences.
 - c. All of the above.
24. Which systems are the new standard voltages for an inverter?
- a. 6 V and 12 V
 - b. 12 V and 24 V
 - c. 24 V and 36 V
 - d. 24 V and 48 V
25. DC electrical outlets can be distinguished from AC outlets by_____.
- a. A different shaped plug receptacle cover plate.
 - b. A DC label on the cover plate.
 - c. A 12-volt cigarette lighter socket.
 - d. All of the above.

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