

**Final Exam**  
**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.