

1. A fall protection system must be in place for all work done at heights in excess of
 - a. 4 feet
 - b. 6 feet**
 - c. 8 feet
 - d. 10 feet

2. A circuit breaker performs the same function
 - a. as a fuse
 - b. as a switch
 - c. as over-current protection
 - d. all of the above**

3. High voltage will trip a circuit breaker
 - a. when it is over 600 volts DC
 - b. when it is AC voltage only
 - c. at the apex of a sine-wave
 - d. voltage is not what typically trips a breaker**

4. Between the main panel and the inverter, you have
 - a. a DC disconnect
 - b. an AC disconnect**
 - c. sometimes a charge controller
 - d. 2 of the above are correct

5. Between the array and the inverter, you have
 - a. a DC disconnect
 - b. an AC disconnect
 - c. sometimes a charge controller
 - d. 2 of the above are correct**

6. If you had modules facing directly north and oriented vertically (90 degrees tilt) would there be a time of the year when the sun rays would hit the panels at 38 degrees latitude? If so, how many months of the year would the sun hit the north facing modules?
 - a. 0 months
 - b. 3 months
 - c. 6 months**
 - d. 9 months

7. 2 phase is

- a. always 120 volts
- b. always 110 volts
- c. always 240 volts
- d. none of the above

8. Utility interconnection is done in this order

- a. PV, charge controller, battery, main panel, inverter
- b. PV, inverter, meter, breaker
- c. PV, DC disconnect, AC disconnect, inverter, grid
- d. PV, charge controller, battery, inverter, grid

9. In California, magnetic North is pointing?

- a. more south than true north
- b. true north
- c. more west than true north
- d. more east than true north

10. The critical design month is the worst case scenario where the load and the _____ are used to size the PV system

- a. peak demand
- b. insolation data
- c. total power demand
- d. duty cycle

11. If you combining solar and wind energy in an off-grid system, it is

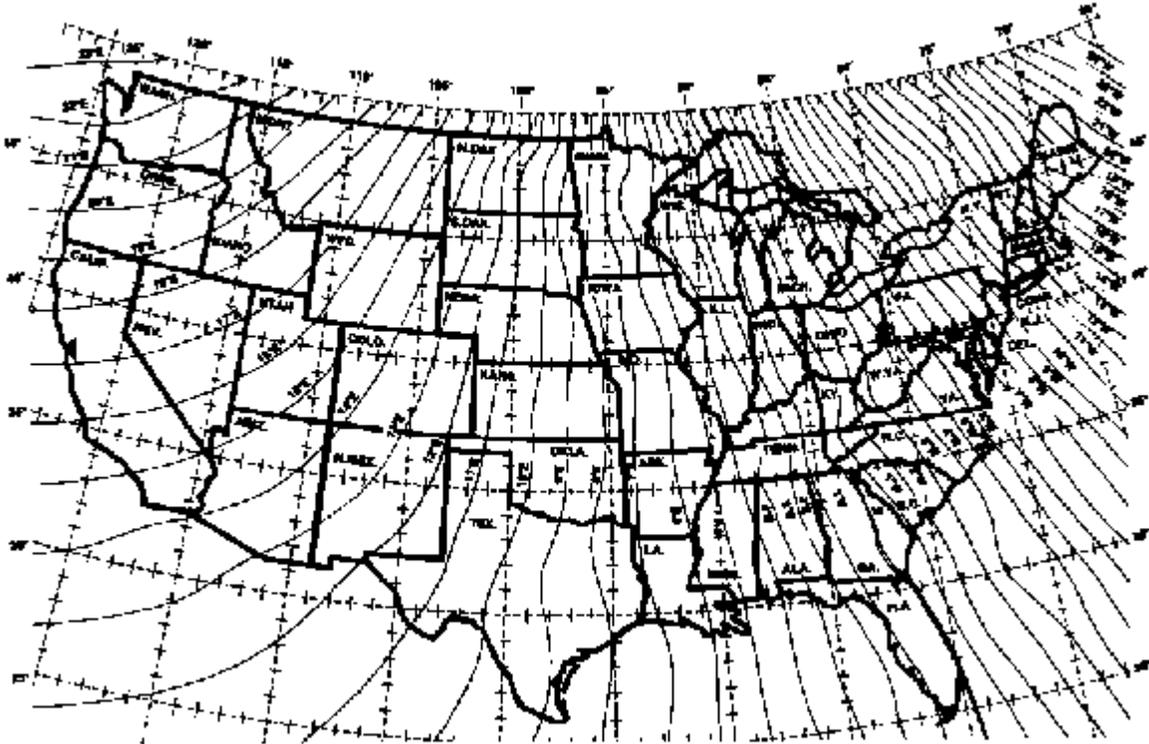
- a. bimodal
- b. indirect
- c. sinusoidal
- d. hybrid

12. Irradiance proportionally effects:

- a. Amperage
- b. Voltage
- c. Air mass
- d. NOCT

13. The further north you are, the better it is to

- a. wash your array
- b. increase your tilt angle
- c. decrease your tilt angle
- d. decrease your azimuth

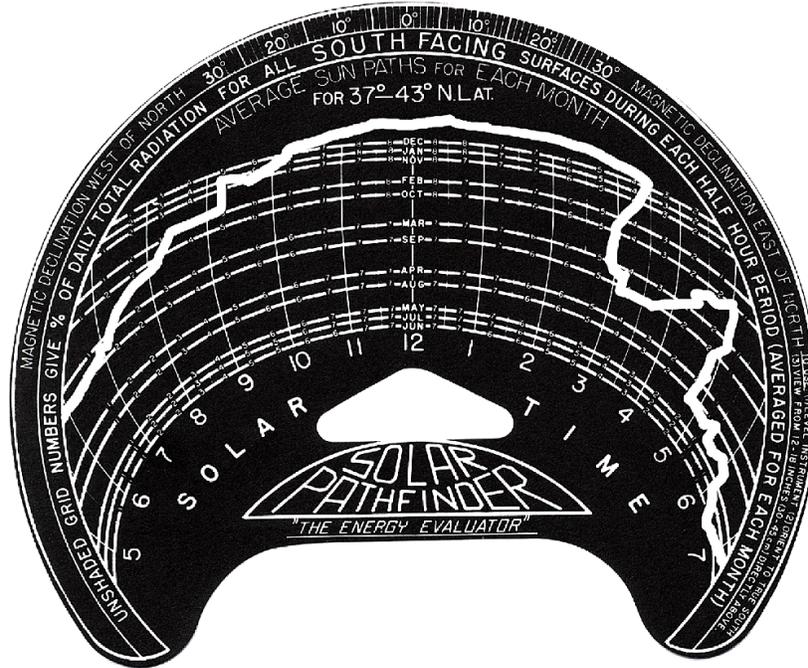


14. According to the map above

- a. the sun rises in the east and sets in the west
- b. there are poles everywhere
- c. in some places, magnetic and solar north are different
- d. the longitudinal continuum transects the sun charts cloud correction pattern

15. Temporarily shorting the output terminals of a PV module will

- a. destroy the module if the short is not immediately cleared
- b. have no effect on the module
- c. destroy the insulation of the module wiring if the short is not immediately cleared
- d. cause damage only if the module is connected in series with other modules



16. According to the sun path diagram above

- e. the sun sets at 4pm sometimes
- f. the sun rises on the horizon in the summer
- g. solar noon is the same as noon local time
- h. the solar pathfinder was not level

17. In the location above, on a clear day, the sun will shine in February for

- a. less than 3.5 hours
- b. 4.5 hours
- c. 5 hours and 45 min
- d. more than 6 hours

18. In the sun path diagram above, for a grid tied system, you would want to tilt your modules _____ for greatest annual net solar energy

- a. to an angle equal to the latitude from the horizontal
- b. to an altitude angle greater than the latitude and due south
- c. to an azimuth that is east of south and an altitude angle less than latitude
- d. to an altitude angle that is less than the latitude to maximize sun on short winter days

NABCEP test review Workshop @ Solfest 2008 answer key

8-17-08

www.PVstudent.com

Test by Sean White

19. When the sun sets on summer solstice, it is the farthest _____ that it will ever set.

- a. North
- b. South
- c. East
- d. West

20. The best way to increase your PV output is to

- a. switch from stand alone to interactive
- b. decrease your voltage drop by 18% with less wiring
- c. add 20% more PV modules
- d. switch from East facing to South facing on a roof slope that is within 10 degrees of latitude

21. If $V=IR$ then

- a. $I=VR$
- b. $IR=A$
- c. $I=.5VR$
- d. $V/I=R$

22. What are the factor(s) that inhibit higher voltages in PV?

- a. Cloud cover
- b. Increased irradiance
- c. Hot weather
- d. Cold weather

23. The voltage drop of a higher voltage system, all else being the same, would be

- a. higher
- b. a higher percentage
- c. a lower percentage & the same voltage drop
- d. lower amps

24. Linear current boosters

- a. are commonly used in grid tied systems
- b. are commonly used in direct pumping applications and drop voltage
- c. don't work well in the morning
- d. decrease ohms per kilo-feet in wire sizing applications

NABCEP=North American Board of Certified Energy Practitioners www.nabcep.org

25. Irradiance is

- a. measured in sun hours per day
- b. measured in watts
- c. measured in watts per square meter
- d. irradiation multiplied by time

26. In St. Paul MN, the sun is up

- a. the same amount of hours as there are sun hours per day
- b. less than the amount of sun hours per day at the equinox
- c. more than the number of sun hours per day part of the time
- d. none of the above

27. The length of time a load is on

- a. is proportional to the power used
- b. is proportional to the energy used
- c. is inversely proportional to the power used
- d. is proportional to amperage *only* if a modified sine waveform inverter is used

28. Equinox

- a. Is the same day everywhere in the world at the same time
- b. Means the sun is directly overhead at the tropic of Capricorn
- c. Is always on the 21st
- d. Happens once a year

29. If the grid shuts down

- a. you can help your neighborhood by powering it
- b. only if all of your neighbors agree, you can power the neighborhood
- c. it is highly unlikely that your modules can charge your batteries in an interactive battery backup system
- d. it can cause severe damage to your inverter if it is not grounded properly

30. For the NABCEP PV Entry Level Certificate of Knowledge Examination, you have to bring

- a. a pencil & a **well rested** mind
- b. a **normal calculator** & not a cell phone
- c. a calm **well rested** analytical mind
- d. all of the above (including a **calm well rested mind**)