



Name \_\_\_\_\_

Advanced Photovoltaic Systems

Diablo Valley College

AET 230-8204

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Final Exam-May 16, 2009

1. In a properly designed system, you can fit more modules on a roof if
  - a. The tilt angle is greater
  - b. The tilt angle is less
  - c. The tilt angle does not make a difference of how many modules you can fit
  - d. You are below the equator
  
2. Wiring modules in series rather than parallel
  - a. Decreases voltage drop
  - b. Increases voltage drop
  - c. Increases amperage on wires
  - d. Is illegal according to the NEC because of dangerous currents and arcing
  
3. The US federal incentive for residential PV in 2009 is
  - a. A rebate
  - b. A \$2000 tax credit
  - c. A 30% tax credit
  - d. A rebate and a tax credit
  
4. In PG&E territory, if you produce more than you use in a year
  - a. PG&E will write you a check
  - b. You will get a credit for the next year
  - c. There are no financial incentives for overproducing
  - d. PG&E has monthly net metering, so you "true up" every month
  
5. A commercial "flat roof"
  - a. Is really a low slope roof
  - b. Has a zero degree slope always
  - c. Can never be penetrated, thus a ballasted system must be used
  - d. Is a great application for composition shingles and QuickMounts

6. Thin film PV
  - a. Is made from silicone ingots
  - b. Is made from silicon ingots
  - c. Is not made from silicon or silicone ingots
  - d. Is made from wafers
  
7. The most expensive mistake in most cases would be
  - a. Forgetting to add the price for screws in your costs
  - b. Forgetting to add integration costs into a 5 year old commercial roof
  - c. Forgetting to add plumbing costs
  - d. Using stainless steel grounding clips
  
8. The chapter in the NEC dedicated to PV is
  - a. 720
  - b. 690
  - c. 360
  - d. None of the above
  
9. When determining DC voltage drop, you have to calculate a distance. This distance is
  - a. The distance from the inverter to the PV in FT
  - b. The distance from the inverter to the PV in kFT
  - c. The distance from the inverter to the PV in kFT multiplied by 2
  - d. The distance from the transformer on the pole to the charge controller in FT
  
10. A wire in a higher ambient temperature location
  - a. Can carry less voltage
  - b. Can carry less current
  - c. Can carry more voltage
  - d. Can carry more current
  
11. Solar breaker + main breaker =
  - a. Busbar rating
  - b. 0.8 busbar rating
  - c. 120% of busbar rating
  - d. You should never put a solar breaker on the same busbar as the main breaker
  
12. A 2 volt lead acid battery has
  - a. 1 cell
  - b. 2 cells
  - c. 3 cells
  - d. 4 cells

13. The active plates on a lead acid battery that work best for PV are
- Thick
  - Thin with lots of surface area
  - Diminished
  - Ingot
14. The NEC
- Stands for New Electric Code
  - Is published by the National Fire Protection Association
  - Is a law that cannot be broken
  - Has strict laws about voltage drop
15. The NEC definition of a blocking diode relating to PV is
- It blocks current from entering the capacitor
  - It will bypass a row of cells in a module
  - It blocks reverse current flow into a PV source circuit
  - None of the above
16. The NEC definition of a PV source circuit is
- Wires from junction or combiner box to inverter
  - Wires from PV to combiner or junction box
  - Wires between modules in a string, but not to the junction or combiner box
  - All BOS wiring in a PV source system
17. The NEC definition of an interactive system is
- PV system in series with the grid
  - PV system in series or parallel with the grid
  - PV system parallel to the grid
  - PV system that you can monitor and alter the MPPT over an internet connection
18. When you wire modules in series on a cold day
- The voltage increases
  - The amperage increases
  - The voltage decreases
  - The amperage decreases significantly
19. On the inverter in the front of the class the label marked 19 is
- AC input
  - AC output
  - DC input (left bottom side of SMA 5000US)
  - DC output

20. On the inverter in the front of the class the label marked 20 is
- a. AC input
  - b. AC output (right bottom side of SMA 5000US)
  - c. DC input
  - d. DC output

Please indicate how you participated in the class, i.e. did you present, sponsor a field trip, show up to every class (after you enrolled), take every quiz, etc.

Comments/suggestions:

Good luck in the renewable energy world!