

NAME: _____

DATE: _____

Choose the best answer. Each question has one best answer.

5A:1) Series vs Parallel Solar Panel wiring?

- ☐ A) For series panels you double the voltage and half the current
- ☐ B) For series panels you double the voltage with same current
- ☐ C) For parallel panels you double the current with same voltage
- ☐ D) For parallel panels you double the voltage and double the current
- ☐ E) B & C

5A:2) How many amps of current per solar panel?

- ☐ A) 30 amps per solar panel
- ☐ B) 10 amps per 100 watts of 12-volt solar panels
- ☐ C) 20 amps per 100 watts of 12-volt solar panels
- ☐ D) None of the above

5A:3) How do you pick the proper Solar Panel MPPT controller?

- ☐ A) You need to calculate total current and voltage of solar panels
- ☐ B) Pick the next smallest size MPPT controller
- ☐ C) Pick the next largest size MPPT controller
- ☐ D) A & B
- ☐ E) A & C

5A:4) Do solar panels need a disconnect switch?

- ☐ A) No, just hook them up in the dark
- ☐ B) No, there's no shock hazard at low voltage
- ☐ C) Yes, you want to disconnect solar panels when working on batteries
- ☐ D) Doesn't matter either way

5B:1) What is a SmartPlug connector?

- ☐ A) It has lights to indicate proper polarity
- ☐ B) It disconnects RV from dangerous power
- ☐ C) It will change polarity automatically
- ☐ D) It's a brand of marine-grade shore power connectors

5B:2) How can you tell a 30-amp from a 50-amp shore power connector?

- ☐ A) 30-amp has 3 contacts
- ☐ B) 50-amp has 4 contacts
- ☐ C) They both have 3 contacts
- ☐ D) They are both plainly marked
- ☐ E) A & B

5B:3) Should you train a customer how to use a twist-lock plug?

- ☐ A) No, everyone know how they connect
- ☐ B) No, twist-lock plugs automatically make full contact
- ☐ C) Yes, they might hook them up backwards
- ☐ D) Yes, unless plugs are twisted properly they can melt down

5B:4) Is the locking ring on a twist-lock plug really needed?

- ☐ A) No, they lock themselves
- ☐ B) Yes, it provides a weather-proof seal
- ☐ C) Yes, it supports the heavy power cord
- ☐ D) B & C

5C:1) How much charging current is possible with a 7-way trailer plug?

- ☐ A) 14 Amps
- ☐ B) 14 Amps
- ☐ C) 5 Volts
- ☐ D) 5 Amps

5C:2) How much current is needed to power a residential refrigerator?

- ☐ A) 5 Volts at 120 Amps
- ☐ B) 5 Amps at 12 Volts
- ☐ C) 50 Amps at 120 Volts
- ☐ D) 50 Amps at 12 Volts

5C:3) What does a DC to DC charger do?

- ☐ A) Steps the voltage up to what the battery needs for charging
- ☐ B) Steps the voltage down to what the battery needs for charging
- ☐ C) Limits the current to prevent overcharging the battery
- ☐ D) None of the above
- ☐ E) All of the above

5C:4) Can you use the 7-way trailer plug for a DC/DC charger?

- ☐ A) No, since you'll be limited to 5 amps current
- ☐ B) Yes, but you'll be limited to 50 amps current
- ☐ C) No, it needs 120-volts
- ☐ D) None of the above

5D:1) Is there an easy way to upgrade the charging current in a load center?

- ☐ A) Yes, you can get drop-in charging modules from WFCO and Progressive
- ☐ B) No, you'll always need to replace the entire load center
- ☐ C) No, if the load center is old you'll need to replace the entire load center
- ☐ D) A & C

5D:2) Should you change to heavier wires with a higher output converter?

- ☐ A) No, manufacturers always make the wires heavier than needed
- ☐ B) Yes, you need to size the wire gauge will handle higher current
- ☐ C) No, it's only 12 volts
- ☐ D) A & C

5D:3) Will older FLA/AGM converters charge Lithium Batteries?

- ☐ A) Yes, it's all 12 volts DC so the batteries will fully charge
- ☐ B) Yes, but a FLA/AGM converter will only charge Lithium Batteries to 85%
- ☐ C) No, they'll charge the battery too slowly
- ☐ D) No, they'll charge the battery too quickly

5D:4) Are the newest Lithium-only chargers 2-stage?

- ☐ A) Yes, 13.6 and 14.5 volts
- ☐ B) No, all new Lithium chargers are 3-stage
- ☐ C) Yes, but you can never use them on FLA/AGM batteries
- ☐ D) A & C

5E:1) Should RV owners bring Lithium batteries inside and put them on a charger?

- ☐ A) No, a Lithium battery it will self-discharge a 2% per month
- ☐ B) Yes, Lithium batteries discharge at 20% per month
- ☐ C) No, trickle chargers are not needed for Lithium batteries
- ☐ D) Not if you fully disconnect them from safety detector loads
- ☐ E) A, C & D

5E:2) Why do RV house batteries discharge during winter storage?

- ☐ A) Batteries self-discharge more during cold temperatures
- ☐ B) Parasitic loads from Smoke, CO and LP detectors
- ☐ C) There are ghost voltages in the wires that cause discharge
- ☐ D) None of the above

5E:3) Should RV owners just plug into shore power for storage?

- ☐ A) Yes, all converter/chargers are safe
- ☐ B) No, a 2-stage converter can cause battery boil over
- ☐ C) Maybe, but they'll need to check battery water level every month
- ☐ D) B & C

5E:4) Should you add a battery disconnect switch?

- ☐ A) Yes, on the positive battery terminal
- ☐ B) Yes, on the negative battery terminal
- ☐ C) No, all modern RVs have a master battery shutoff switch
- ☐ D) A & B