

National Marine Manufacturers Association
Product Compliance Specialist Examination
A. C. Electrical (12/07)

1. Which of the following would be a non-current carrying conductor in an AC electrical system?
 - a. The White wire
 - b. The Green wire
 - c. The Red wire
 - d. The Black wire

2. A current carrying conductor that is connected to the side of the power source which is intentionally maintained at ground potential is a:
 - a. Grounding conductor
 - b. Ground
 - c. Neutral conductor
 - d. Galvanic isolator

3. An isolation transformer will:
 - a. Remove the need for a galvanic isolator and a reverse polarity indicator.
 - b. Be considered a source of power for AC.
 - c. Be rated to be equal to the shore power supply.
 - d. All the above are true.

4. An ungrounded conductor of a branch circuit is to be provided with overcurrent protection at the point of connection to the main switchboard. The circuit breaker or fuse that is used for this purpose is rated:
 - a. Not to exceed the maximum current carrying capacity of the conductor between the fuse or circuit breaker and the load
 - b. At least for the nominal voltage of the supply circuit
 - c. To 150% of the conductor ampacity if no standard circuit breaker is available for 100%
 - d. All the above

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5. The AC grounding conductor should:
- a. be connected to AC neutral at the source
 - b. be connected to the AC grounded conductor at the inverter output when in invert mode, generator output, and at the secondary of an isolation transformer
 - c. be connected to the engine negative terminal or its bus
 - d. all the above
6. The shore power cable must be:
- a. Provided by the boat manufacturer
 - b. A non-locking flexible cord
 - c. Installed with a Galvanic Isolator
 - d. Equipped with a male end connector at the boat
7. The reason for posting a shore-power inlet warning sign is:
- a. To turn-off the shore power connection correctly
 - b. To establish reverse polarity
 - c. As a reminder to disconnect the cable prior to getting underway
 - d. To minimize fire and shock hazards
8. Electrical conductors are marked with:
- a. Type of conductor, voltage, gauge and temperature rating
 - b. The electrical rating in volts, amperes or watts
 - c. Ignition protection if applicable
 - d. The size of overcurrent protection that is to be installed
9. The sources for AC electrical power for a boat are:
- a. Generator, Shore Power, Secondary of an Isolation Transformer, Inverter output in the invert mode
 - b. Galvanic Isolator and Reverse Polarity Devices
 - c. Shore Power and generator only
 - d. An inverter in the pass through mode

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10. When more than one shore power inlet is installed, ABYC recommends that the neutrals are
- a. not connected together
 - b. connected together
 - c. connected to the AC grounding bus
 - d. connected to the engine negative terminal
11. Additional fuses or circuit breakers must be installed within _____ feet of the shore power inlet if the power feed conductor from the shore power inlet to the main circuit breaker exceeds:
- a. Ten feet measured along the conductor
 - b. 72" measured along the conductor
 - c. 40" measured along the conductor
 - d. Ten feet measured in a straight line
12. While installing a clothes dryer, it is noted that a neutral-to-ground strap is provided by the manufacturer, as you must connect the clothes dryer to the boat's AC grounding system. The neutral-to-ground strap:
- a. Must be removed
 - b. Is connected to the neutral conductor
 - c. Is redundant
 - d. Is never removed
13. Non-metallic clamps or straps should not be used for support of electrical conductors:
- a. Over moving shafts
 - b. Over any machinery or passageways if failure could result in a hazardous situation.
 - c. Over engines
 - d. All of the above

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14. What is the minimum temperature rating for an AC conductor that will be used in an engine space?
- a. At least 75 degrees F and be oil resistant
 - b. Oil resistant and temperature is not important
 - c. At least 167 degrees F and oil resistant
 - d. At least 140 degrees F
15. The minimum rating for a flexible cord used in an AC electrical system should be at least:
- a. 600 volts
 - b. 120 volts
 - c. 240 volts
 - d. 300 volts
16. The minimum wire size (gauge) that is permissible for use in an AC electrical system is:
- a. 12 AWG if used in the shore power supply
 - b. 14 AWG if connected to a generator output
 - c. 16 AWG
 - d. 20 AWG if connected to a 5 milli amp GFCI breaker
17. A branch circuit that supplies a combination of receptacle loads and permanently connected loads, shall not supply fixed loads in excess of:
- a. 600 watts for a 20 amp circuit
 - b. 600 watts for a 15 amp circuit
 - c. 1000 watts for a 15 amp circuit
 - d. 2000 watts for a 20 amp circuit
18. All AC Conductors shall be supported or secured throughout their length at least:
- a. Every 12 inches
 - b. Every 40 inches
 - c. Every 18 inches
 - d. Every 7 inches

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19. Reverse polarity is defined as the reversed connection of which circuits?
- a. neutral and ground
 - b. Line 1 and Line 2
 - c. Hot and neutral
 - d. Hot and ground
20. Downrating of the ampacity of AC conductors to avoid excessive heat build up is done because of
- a. Voltage drop
 - b. Thin insulation
 - c. Bundling of more than 2 current carrying conductors
 - d. Too few wire strands
21. Reverse polarity indicators are installed
- a. Between the green and white conductors
 - b. Between the white and black conductors
 - c. In the green wire
 - d. Between the black and green conductors
22. Which of the following is the function of the galvanic isolator?
- a. Block AC fault current and pass low voltage galvanic current
 - b. Block all AC current
 - c. Block low voltage DC current and pass AC current associated with the grounding conductor
 - d. Reduce stray current corrosion
23. The recommended circuit location to install a galvanic isolator is between the
- a. Shore power grounding conductor and the AC grounding bus
 - b. AC grounding bus and DC negative bus
 - c. Shore power neutral and AC grounding bus connected after the shore power breaker
 - d. AC neutral and AC grounding bus connected ahead of the shore power breaker

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24. Four 10 gauge AC current carrying conductors rated at 105 degrees C that are bundled inside the engine compartment for a distance of 3', must have their ampacity down rated:
- a. to 36 amps
 - b. to 30.6 amps
 - c. to 42 amps
 - d. to 35.7 amps
25. The transfer from one AC power source to another is made by:
- a. a battery switch
 - b. a means that opens all current carrying conductors before closing the alternate source
 - c. paralleling the sources
 - d. a means that energizes the circuits from both sources before making the circuit to the alternate source