

## KNOWLEDGE PROBE 2: TROUBLESHOOTING

### An Approach to Electronic Troubleshooting

#### Learning Objectives

- Identify the system level, equipment level, module or PC board level, and component level approaches to troubleshooting.
- Determine the most efficient level of repair for various situations.
- Describe the basic tests that are used to determine if a circuit is working.
- Identify the logical step-by-step process used for isolating defects.

1. Which level repair is the fastest but the most expensive in a large system?
  - a. Component
  - b. Equipment
  - c. Module
  - d. System
2. Which level repair is the most economical and rapid?
  - a. Component
  - b. Equipment
  - c. Module
  - d. System
3. With the cost of electronic components very low, why is component level repair often the most expensive?
  - a. Components are often not available
  - b. Components usually go bad quickly
  - c. The equipment has to be sent out to a repair depot for service
  - d. The long troubleshooting and repair time may result in major losses in production output that are more expensive than any faster more expensive fix
4. It is estimated that it will take 4 hours of troubleshooting and service to repair a module. The technician pay rate is \$60/hour. A new module costs \$45. Should you repair or buy the new module?
  - a. Buy new module
  - b. Repair the module
5. What is the first step in a formal troubleshooting process?
  - a. Do a visual inspection
  - b. Take notes from the operator reporting the problem
  - c. Try to duplicate the problem reported
  - d. Turn on the power



6. How do you recognize or discover the symptoms of a problem?
  - a. Look at LEDs, meters, or other outputs for clues
  - b. Observe any LCD readouts
  - c. Use the video monitor and any software
  - d. All of the above
7. If you are testing for the presence of DC power and find that it is not there, a next logical troubleshooting step would be to
  - a. Check for AC power
  - b. Make a thorough visual inspection
  - c. Replace the power supply
  - d. Start troubleshooting the power supply
8. If DC power is present but the voltage values are incorrect, the most likely problem is a/an
  - a. Defective load
  - b. Incorrect level of AC input
  - c. Misadjusted or defective power supply
  - d. Uncalibrated DC multimeter
9. Assume you are visually inspecting a power supply printed circuit board. That will often reveal the problem, but it should also be accompanied by
  - a. A smell and touch test
  - b. A thorough cleaning
  - c. Extensive AC and DC voltage measurements
  - d. Running any diagnostic routines
10. After the problem has been isolated and repaired, the final step should be to
  - a. Notify the user
  - b. Run a full diagnostic test
  - c. Test the equipment to see that it functions as it should
  - d. Turn off the power and let the system cool before turning it over to the user