Info Section Troubleshooting

1. Which two laws are necessary to properly troubleshoot using a voltmeter? Kirchhoff’s and Ohms Laws


3. What value of voltage do most voltmeters measure? RMS or effective

4. How do you calculate the internal resistance of an analog voltmeter? Multiply the meter sensitivity of the meter by the voltage scale it is set on for ohms/volt value

5. What is a non-linear scale? One where the numbers are closer together on one end than the other

6. Do most digital voltmeters have a zero adjusting screw? No it is automatic

7. Why is there a needle locking device on most clamp-on ammeters? For awkward places when you may not be able to see the value when it is clamped on

8. You should never move the range switch on a clamp-on ammeter when it is around a current carrying conductor. True or False? False

9. What is a VOM? Volt Ohm Milliammeter

10. What is a DMM? Digital Multimeter

11. What are two reasons for moving the selector switch off the ohms scale when storing a multimeter? Save battery and so next person doesn’t go to a live circuit to test voltage and forget to switch the scale

12. What is the proper name for a megger? Megohmmeter

13. How will the reading act when testing a long power cable or large motor to ground with a megger? It will show a ground fault at first as the cable charges then begin to move up the scale to the proper reading

14. How long should you discharge a long power cable after a megger test? As long as the test

15. What are infrared scanners used for? Test the temperature of a surface without contact
16. What are two possible causes of a rise in temperature for a piece of equipment? 
   Bad bearings or partially blocked ventilation path

17. What is a Hipot Test? Applying a high voltage to a piece of equipment and 
   measuring the leakage current

18. How is a motor rotation indicator connected to a motor? Remove the power, then 
   connect Phase 1 to Red lead, Phase 2 to black lead, and Phase three to blue lead. 
   Turn switch on then rotate motor in the desired direction. Switch will indicate 
   ABC or BAC sequence for connection

19. How is a phase sequence indicator used? With power on, connect leads same as 
   above and the meter will indicate the system has an ABC or a BAC sequence

20. What is the difference in operation of a capacitor meter and a capacitor analyzer? 
   Meter will test the capacitance of the capacitor. The analyzer will test for opens, 
   shorts and leakage currents

21. How will an open and a short in a capacitor show up on an ohmmeter? Open- 
   infinity, short-zero ohms

22. What device is used to locate the source conductor for a circuit without de- 
   energizing the circuit? Signal transmitting source locator

23. What information is available from testing with a logic probe? A high, low, or 
   pulsating logic level and which logic family is being tested (ttl or cmos)

24. What is one advantage of non-contact tachometers? Do not add load on delicate 
   machinery or affect the speed

25. How does a stroboscopic tachometer work? Adjust the tachometer until the object 
   in motion appears stopped then check the reading

26. How does a photo tachometer work? Attach a piece of reflective tape to the object 
   being measured and point the hand-held tachometer so it can see the tape each 
   revolution

27. What are the two values on the vertical axis and the horizontal axis when 
   measuring voltage with an oscilloscope? Voltage on the vertical and time on the 
   horizontal

28. Which control on an oscilloscope will set the time of the sweep so you can get at 
   least one complete sine wave in the window? Time Base

29. What is the purpose of voltage-sensing attenuation probes with an oscilloscope? 
   They will faithfully reproduce the voltage signal
30. What is the purpose of desoldering braid? Wick solder away from a joint when you want to remove a connection.

31. When installing a temporary (clip) jumper in a system to be tested, it should be neatly installed to blend in with the other wiring. True or False? False.

32. When a temporary jumper must be left in a system for a time, what is the proper procedure to maintain safety? Leave a note explaining why the jumper is there.

33. What are patch cords and extension cables used for? Allow testing of equipment while it is running from a safer or easier location.

34. What is the purpose of extender boards? Protrude out flush with the rack and allow testing of a PCB.

35. What is the purpose of freeze sprays? Cool a component so it can be determined if it is overheating and causing a problem.

36. What is the main advantage of IC monitor clips? Allow for testing up to 16 pins at once with an indicator light for each.

37. What are some alternate power sources that must be considered when isolating equipment for maintenance or repair? UPS, standby generator, capacitors, transformers fed on secondary side.

38. What precaution should be taken when working around thermal systems? Allow a cooling down period before work.

39. What precautions must be taken before working on hydraulic or pneumatic systems? Shut off and lock, bleed off pressure, block any movement from gravity.

40. What precautions should be taken when working on live equipment? Wear face shield, gloves, rubber apron, rubber mat, no jewelry (chains, rings, watches).

41. What is your most efficient tool when troubleshooting a piece of equipment? Operator interview.

42. What is the best time to get familiar with the operating sequence of a machine? When it is working properly (Is there a duplicate machine in the facility?)

43. What is the best source of factual information for a particular machine? Manuals and drawings.
44. What is the advantage of keeping good records of changes that may have taken place with the machine or the environment? Allows a chance to look for things that may have altered the operation of the equipment.

45. What is the first check that should be made in a no-go situation for a piece of equipment? Fuses.

46. What are the most difficult problems to diagnose and repair? Intermittent.

47. What is the dividing method of locating a fault? Break a circuit in the middle and check both directions.

48. Should more than one person take the lead in troubleshooting a piece of equipment? No.

49. What is the meaning of the term “thinking beyond the fix”? Trying to prevent the fault from happening again or on another piece of equipment.

50. What should be done after each change is made in a system? Verify the results.

51. What are some advantages and disadvantages of substitute troubleshooting? Fast and easy but can damage new parts.

52. Why is it important to document any changes to the equipment? Inaccurate documentation can lead to hazards for future troubleshooters.