Pretest Power Quality

1. What is “power quality”? The concept of powering and grounding sensitive electronic equipment in a manner suitable to the operation of that equipment.

2. Which devices are typically more likely to be affected by power quality issues? Solid-state electronics.

3. What is the main cause of voltage surges at user sites? Switching of reactive loads.

4. What is the difference between a voltage surge and a voltage swell? Swell is a brief increase in rms value of voltage.

5. What are voltage transients? Voltage disturbances that are shorter than sags and swells.

6. How do transient voltage surge suppressors work? Clipping them off by providing a low-impedance path.

7. What are metal-oxide varistors used for? Clamp transients.

8. What are harmonics? Irregularities in the wave form that repeat cycle after cycle.

9. What is the major cause of harmonics? Non-linear devices

10. What are non-linear power devices? Electronic power converters,

11. What is the difference between harmonics and transients? Transients only appear briefly after an abrupt change in a system. Harmonics occur in the steady state and are multiples of the frequency.

12. Which power is not significantly affected by voltage distortion? Active

13. What is a triplen harmonic? Odd multiples of the third harmonic 3, 9, 15, 21
14. What are some of the most common non-linear loads? Power converter, motor drives, battery chargers, electronic ballasts.

15. Do three-phase power converters generate third-harmonic currents? No

16. What are the advantages and disadvantages of DC drives compared with AC drives? Simpler control systems, higher torque and wider range of speeds. Higher purchase and maintenance costs.

17. What are the advantages of electronic and magnetic ballasts? Electronic are more efficient but produce more harmonics. Magnetic loose energy as heat but produce minimal harmonics.

18. What is a saturable device? Transformers, motors and other devices with a steel core.


20. What is electromagnetic interference and what is another name for it? Electromagnetic disturbance. RFI


22. What is common-mode noise? Noise between the common or ground wire and the current-carrying conductors.

23. What is low-voltage noise? High voltage? Noise disturbances with peak values less than 2000V. Over 2000V.

24. Which type of disturbances do lightening produce? (common-mode or normal-mode) Both
25. What is electromagnetic coupling? Inductive coupling that causes current to be induced in a conductor or group of conductors.

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27. What type of connection to ground is required by the NEC and CEC? 25 ohms or less.

28. What is the difference between bonding and grounding? CEC definitions?

   Grounding-Providing a low impedance path to earth. Bonding- Electrically connecting all metal, non-current-carrying parts of an electrical system.

29. What is touch potential? Potential difference between any two conductive surfaces that can be touched by an individual.

30. What must be done with the grounding conductor from each individual power supply feeding a load? Tied together by as short a conductor as possible.

31. What are the two methods of shielding? Absorption and reflection.

32. What is the primary purpose of surge protection? Protect equipment

33. What are arc discharge devices best suited for? Direct lightning strikes.

34. What is a varistor? Electronic device whose electrical resistance varies with the voltage applied to it.

35. What is a “Voltage Clamp”? Data line surge suppressor.

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