Chapter 16 Test: Lightning and Surge Protection

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Class: ELT 211 Date:

Carefully read each question, and circle the letter next to the correct answer.

1. Large voltages that develop suddenly on electric transmission and distribution circuits are referred to as what?
   a. Harmonics
   b. Resonance
   c. Capacitance
   d. Surges

2. What is the purpose of a shield wire, or static wire?
   a. To protect the phases from lightning strokes
   b. To better support poles
   c. To give raptors a place to perch
   d. All of the above

3. A static wire must be connected to what?
   a. Pole grounds
   b. Each steel tower or structure
   c. A common neutral is available
   d. All of the above

4. A lightning or surge arrestor is designed to prevent what condition?
    a. Over voltage
    b. Over current
    c. Inductive reactance
    d. Aeolian vibration

5. What voltages are secondary arrestors rated for?
    a. 7200/12470y
    b. 175V and 650V
    c. 3KV through 120KV
    d. 3KV and above

6. Where are station arrestors typically used?
    a. On distribution lines
    b. On transmission lines
    c. On low voltage secondaries.
    d. In substations and generating stations on major equipment

7. Other than lightning, how are surge voltages generated?
    a. Wind
    b. By operating switches and other equipment connected to the transmission system
    c. Proximity to traffic
    d. None of the above

8. What type of arrestor is now the industry standard?
    a. The silicon carbide valve type
    b. The metal oxide varistor type

9. A lightning or surge arrestor operates like a safety valve on a steam boiler.
   a. True
   b. False

10. What are arrestors that are used on underground systems referred to as?
   a. Intermediate arrestors
   b. Distribution arrestors
   c. Elbow arrestors
   d. Load break elbows

11. Which of these factors do NOT contribute to the selection of the appropriate arrestor for a given application?
   a. Maximum phase to ground voltage
   b. Maximum discharge voltage of the arrestor
   c. Basic insulation level (BIL) of the equipment to be protected
   d. Physical size of the arrestor

12. The arrestor is installed such that when the system is operating at the designed voltage the arrestor is nonconducting.
   a. True
   b. False

13. When an over voltage is induced the arrestor how?
   a. It diverts it to ground
   b. It absorbs the over voltage
   c. It diverts it to consumer equipment
   d. It shorts the line until protective devices open the circuit

14. Lightning arrestors will never fail.
    a. True
    b. False

15. How does a static wire work?
    a. By acting as a shield to divert lightning away from the line
    b. By emitting signals that repel lightning
    c. By basically bringing the grounds potential above the conductors
    d. By making the line less attractive to lightning

16. What are Surges also referred to as?
    a. Resonance
    b. Trace voltages
    c. Farads
    d. Transients

17. Surges are caused by what?
    a. Direct lightning strikes
    b. Nearby lightning strikes to the ground
    c. Switching
    d. All of the above

18. Arrestors are installed at transition points from overhead to underground and vice versa.
    a. True
    b. False

19. How many classes of silicon carbide valve type surge arrestors are there?
    a. 2
    b. 4
    c. 6
    d. 10

20. Which type of resistor provides the highest level of protection, and is used on major pieces of equipment?
    a. Secondary arrestors
    b. Distribution arrestors
    c. Intermediate arrestors
    d. Station arrestors