BICSI Outside Plant Designer (OSP) Practice Exam (Sample)

Study Guide

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Questions

1. **Which type of poles should be avoided as storm guying points?**

   A. Standard poles

   B. Corner or junction poles

   C. Reinforced poles

   D. Lightweight poles

2. **What height does not interfere with aircraft authorities?**

   A. 100'

   B. 200'

   C. 300'

   D. 400'

3. **What should be used to prevent a pole from leaning sideways if the load is insufficient for guying?**

   A. Ground braces

   B. Straps

   C. Additional weight

   D. Support blocks

4. **What device provides stability for a pole and keeps it from sinking into the ground?**

   A. Ground braces

   B. Pole key anchor

   C. Plank bracing platforms

   D. Dead end guys

5. **Which type of fiber optic cable features individual jackets for each tight buffered fiber?**

   A. Distribution

   B. Breakout

   C. Ribbon

   D. Loose-tube

6. What is the typical distance at which direct buried cables collect ground strikes, determined by soil resistance?

A. 3.5' to 9.5'

B. 6.6' to 19.7'

C. 10' to 25'

D. 15' to 30'

7. Which of the following is a CSI grouping number for telecommunications?

A. CSI 21

B. CSI 27

C. CSI 34

D. CSI 29

8. What stress category does PE 80 belong to?

A. Low Stress

B. Medium Stress

C. High Stress

D. Ultra High Stress

9. Which anchor does not depend on soil for holding strength and is ideal for steep angles?

A. Screw anchor

B. Cone anchor

C. Plate anchor

D. Concrete anchor

10. Which type of cable is suitable for direct burial applications?

A. PSAP Polyethylene, aluminum steel, polyethylene

B. Fiber optic cables

C. Coaxial cables

D. Twisted pair cables

Answers

1. B
2. B
3. A
4. C
5. B
6. B
7. B
8. C
9. C
10. A

Explanations

1. Which type of poles should be avoided as storm guying points?

A. Standard poles

B. Corner or junction poles

C. Reinforced poles

D. Lightweight poles

Avoiding corner or junction poles as storm guying points is important due to their structural characteristics and the stress they encounter during severe weather conditions. Corner and junction poles are typically subjected to higher loads because they are responsible for changing the direction of the cable or supporting multiple lines. This makes them more vulnerable in storm situations where wind and other forces can exert significant lateral stress. Utilizing corner or junction poles for storm guying can compromise the stability of the entire pole system, as these poles may not be designed to handle additional tension from guy wires in extreme conditions. Instead, standard poles or appropriately reinforced poles are generally more suitable for this purpose, as they are designed to withstand lateral loads and can provide better anchoring for guying during storms. Lightweight poles, while also not ideal for storm guying, may not pose the same level of risk as corner or junction poles, which have a critical role in cable support and direction change. Thus, it is essential to choose guying points that can endure the forces experienced during storms without compromising the integrity of the overall installation.

2. What height does not interfere with aircraft authorities?

A. 100'

B. 200'

C. 300'

D. 400'

The height that does not interfere with aircraft authorities is typically set at 200 feet. This is because structures below this height are generally less likely to obstruct low-flying aircraft or interfere with airport operations. Regulatory bodies, such as the Federal Aviation Administration (FAA) in the United States, have guidelines that provide limits for structures in proximity to airports, often designating 200 feet as a safe height for many applications. At heights beyond 200 feet, structures can start to require notifications and potentially have restrictions to ensure they do not pose a risk to air traffic. Therefore, maintaining structures at or below 200 feet is considered a standard practice to avoid complications with air navigation and to comply with aviation regulations.

3. What should be used to prevent a pole from leaning sideways if the load is insufficient for guying?

A. Ground braces

B. Straps

C. Additional weight

D. Support blocks

Using ground braces is an effective method to prevent a pole from leaning sideways when guying is not feasible due to insufficient load. Ground braces provide lateral support by anchoring the pole to the ground at a certain angle, distributing the forces acting on the pole and stabilizing it against wind loads or other external pressures. This stabilization is particularly important in areas where the soil conditions might not allow for traditional guying methods or where it may not be practical to install guy wires. Ground braces come in various configurations, typically creating a triangular support system that enhances the overall strength and stability of the pole. By carefully installing these braces, it is possible to maintain the integrity of the installation and prevent leaning, which could lead to structural failure or safety hazards. Other options, such as straps, additional weight, and support blocks, may provide some level of aid, but they do not address the issue as effectively as ground braces. Straps might offer temporary assistance, while additional weight could shift the center of gravity and potentially exacerbate the problem. Support blocks may help in certain scenarios but lack the comprehensive support that ground braces deliver in terms of lateral stability.

4. What device provides stability for a pole and keeps it from sinking into the ground?

A. Ground braces

B. Pole key anchor

C. Plank bracing platforms

D. Dead end guys

The appropriate choice for a device that provides stability for a pole and prevents it from sinking into the ground is the pole key anchor. This device secures the pole in place, distributing the load and providing additional resistance against downward forces. Proper installation of a pole key anchor helps ensure the pole remains upright and stable, especially during adverse weather conditions or when subjected to lateral forces, such as wind. While other options like ground braces and dead end guys contribute to the overall stability of poles and structures, they serve different specific functions within the support system. Ground braces are primarily used to stabilize the pole laterally rather than prevent sinking, while dead end guys are often employed to support wires at points where they change direction or are terminated but do not address the issue of the pole sinking into the ground. Understanding how the pole key anchor functions in maintaining pole stability is essential for effective and safe installation in outside plant design.

5. Which type of fiber optic cable features individual jackets for each tight buffered fiber?

A. Distribution

B. Breakout

C. Ribbon

D. Loose-tube

The choice of breakout fiber optic cable is accurate because this type of cable is specifically designed with individual jackets for each tight buffered fiber. This configuration provides enhanced protection and allows for easier handling and termination of the fibers. In breakout cables, each fiber is separated and contained within its own protective jacket, making them ideal for applications where individual fibers need to be accessed and terminated separately, such as in situations that require a direct installation into patch panels or connectors. The other types of cables do not offer this configuration. Distribution cables typically have a central strength member and may have several fibers grouped together without individual jackets. Ribbon cables contain multiple fibers organized in a flat ribbon format and do not have individual jackets; they are designed for high-density applications but are less straightforward to terminate individually. Loose-tube cables enclose fibers within a protective tube but do so in a way that groups multiple fibers together, without the individual jackets that define breakout cables. This specific design of breakout cables makes them particularly suitable for certain installations where accessibility and individual fiber protection are crucial.

6. What is the typical distance at which direct buried cables collect ground strikes, determined by soil resistance?

A. 3.5' to 9.5'

B. 6.6' to 19.7'

C. 10' to 25'

D. 15' to 30'

The correct answer is based on the understanding of how ground strikes and soil resistance interact with buried cables. When a ground strike occurs, the electrical energy seeks a path of least resistance to ground. The distance at which this energy can affect buried cables is influenced by the soil characteristics, including moisture content and composition. The range identified (6.6' to 19.7') is appropriate as it reflects typical soil resistance values. This means that ground strikes can affect cables buried within this distance from the surface, especially in soils with varying conductive properties. As such, understanding this range is critical for designing protection measures around direct buried cables, ensuring they are sufficiently shielded from potential electrical surges caused by lightning strikes or other electrical phenomena. Other ranges either extend beyond the practical reach of typical lightning-induced currents in common soil types or do not adequately account for the resistance impact on energy dispersal into the ground. This makes the given range both practical and relevant for OSP design considerations.

7. Which of the following is a CSI grouping number for telecommunications?

A. CSI 21

B. CSI 27

C. CSI 34

D. CSI 29

The CSI grouping number relevant to telecommunications is CSI 27. This classification is part of the Construction Specifications Institute's MasterFormat, which organizes project manuals and specifications. CSI 27 specifically pertains to telecommunications and provides guidelines and standards for telecommunications systems, focusing on the infrastructure needed to support voice, data, and video communication. Understanding the classification provided by CSI is essential for professionals in the telecommunications field since it facilitates clear communication of specific requirements and standards in project documentation. This helps ensure that all parties involved in a project are aligned with the expectations for telecommunications systems.

8. What stress category does PE 80 belong to?

A. Low Stress

B. Medium Stress

C. High Stress

D. Ultra High Stress

PE 80 is categorized under High Stress due to its material properties, which allow it to withstand significant pressures and temperatures when utilized in applications like piping systems. PE 80 refers to a specific type of polyethylene with a minimum required stress rating of 8 MPa, which indicates its capability to handle higher operational stresses compared to lower grades. In contrast, other stress categories such as Low Stress or Medium Stress are associated with materials or applications that require reduced levels of stress and are typically made from materials that do not have the same high-pressure tolerance. Ultra High Stress designations apply to materials with even stricter performance criteria, which would exceed the capabilities of PE 80. Therefore, categorizing PE 80 under High Stress accurately reflects its intended use in demanding environments where it can provide durability and resistance to failure under load.

9. Which anchor does not depend on soil for holding strength and is ideal for steep angles?

A. Screw anchor

B. Cone anchor

C. Plate anchor

D. Concrete anchor

The plate anchor is designed to provide holding strength regardless of soil characteristics, making it particularly effective for applications involving steep angles. This type of anchor utilizes a flat plate that is buried or embedded into the ground, distributing the load across a broader area. This design allows the plate anchor to remain stable under a wide range of conditions, including challenging soil or rocky environments. In scenarios where steep angles are involved, the plate anchor's ability to manage tension and shear forces without relying heavily on the surrounding soil is essential. This makes it suitable for various applications, including telecommunications, where structures need to be secured at inclined angles. Other anchor types, such as screw anchors, cone anchors, and concrete anchors, typically rely on soil composition and characteristics for their holding strength. While they can offer stability in many conditions, they may not perform as effectively in instances where soil quality or angle of application is a concern. Thus, the plate anchor stands out as the ideal solution for demanding anchoring needs in steep environments.

10. Which type of cable is suitable for direct burial applications?

A. PSAP Polyethylene, aluminum steel, polyethylene

B. Fiber optic cables

C. Coaxial cables

D. Twisted pair cables

The suitability of a cable for direct burial applications is primarily determined by its ability to withstand moisture, soil chemicals, and physical pressure while ensuring reliable performance underground. In this context, the PSAP (Polyethylene, Steel core, Aluminum, Polyethylene) cable is particularly appropriate. PSAP cables are designed with materials that are resistant to water ingress and can endure the harsh environmental conditions found in underground installations. The outer polyethylene layer provides a waterproof barrier, while the aluminum and steel components contribute to the cable's strength and resistance to crushing forces, which are common in burial scenarios. In contrast, the other types of cables mentioned may not meet the necessary specifications for direct burial. For example, fiber optic cables can be designed for direct burial, but they require specific protective coatings and are often more sensitive to kinks and sharp bends than PSAP cables. Coaxial cables and twisted pair cables generally do not have the same level of environmental protection and strength required for direct burial without additional protective measures. Understanding the environmental challenges and physical demands of direct burial installations helps clarify why the PSAP cable is a superior choice for this application.