Fundamentals of Surveying (FS) Practice Exam (Sample)

Study Guide

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Questions

1. Who generally holds the title to the beds of navigable streams within most states?

A. The riparian owner

B. The federal government

C. The state department of environmental protection

D. The public of that state

2. What units are commonly used in surveying for measuring distance?

A. Kilometers and centimeters

B. Paces and steps

C. Feet and meters

D. Inches and miles

3. What can improper site grading lead to in a construction project?

A. Increased costs for construction materials

B. Poor drainage and potential structural issues

C. Faster project completion times

D. Enhanced aesthetic value

4. Which of the following is a defining feature of an inscribed angle?

A. Its vertex is outside the circle

B. It must be a right angle

C. Its vertex is on the circle

D. Its sides must be tangents

5. Which element is the controlling call in the description: N54°E for a distance of 298 ft to the shore of Wolf Creek?

A. N54°E

B. 298 ft

C. The thread of Wolf Creek

D. The shore of Wolf Creek

6. What does the U.S. Constitution require before the power of eminent domain can be exercised?

- **A. The owner must be guaranteed adequate compensation for the property**
- **B. The improvement must be for a public use**
- **C. The owner may not be deprived of property without due process of law**
- **D. All of the above**

7. What is the area of a rectangle that measures 6 Gunter's chains and 5 Gunter's chains?

- **A. 3 acres**
- **B. 5 acres**
- **C. 7 acres**
- **D. 10 acres**

8. Which of the following is true regarding land ownership per the Statute of Frauds?

- **A. Ownership is limited to family members only**
- **B. It must be transacted with written agreements**
- **C. All types of transfer must be in writing**
- **D. Title can be transferred verbally**

9. Which device typically defines the line of sight in modern surveying?

- **A. bull's-eye bubble**
- **B. compensator**
- **C. plumb bob**
- **D. spirit level bubble**

10. What feature characterizes a site plan?

- **A. It includes statistical data for project bids**
- **B. It visually represents the relationship of existing and proposed structures**
- **C. It only focuses on underground utilities**
- **D. It lists all resources needed for construction**

Answers

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

Explanations

1. Who generally holds the title to the beds of navigable streams within most states?

A. The riparian owner

B. The federal government

C. The state department of environmental protection

D. The public of that state

In most states, the title to the beds of navigable streams is generally held by the public of that state. This principle is rooted in the common law doctrine of "navigability" which asserts that navigable waters are public resources owned by the state, intended for the use and benefit of the general public. This ownership includes the streambed itself, as it allows for recreational, environmental, and economic activities that can occur in and along these waterways. This concept is significant because it underscores the public's right to access and utilize navigable waters, ensuring that they remain open for navigation and related activities. As such, the management and protection of these waterways often fall under the jurisdiction of state environmental agencies, but the underlying title resides with the public stakeholders rather than private individuals or other entities.

2. What units are commonly used in surveying for measuring distance?

A. Kilometers and centimeters

B. Paces and steps

C. Feet and meters

D. Inches and miles

In surveying, distance measurement units are crucial for accuracy and consistency across various applications. Feet and meters are widely used because they represent both imperial and metric systems, allowing surveyors to work in a variety of contexts depending on regional preferences or project requirements. The use of feet is standard in the United States for many types of surveying practices, while meters are the international standard in most other countries. This duality makes it convenient for surveyors to collaborate in a global setting, as they can easily convert between the two systems when necessary. Additionally, using these units provides a convenient range for measuring land areas, building dimensions, and other distances typically encountered in surveying tasks. Other options, while they incorporate distance measurements, are less common or not standardized in professional surveying practice. Kilometers and centimeters, for example, are not as practical for typical land surveying measurements due to their scale in relation to project scopes. Paces and steps are subjective and can vary significantly between individuals, making them unreliable. Lastly, inches and miles, while they are units of length, are less frequently utilized together in surveying contexts as they can complicate calculations and conversions.

3. What can improper site grading lead to in a construction project?

A. Increased costs for construction materials

B. Poor drainage and potential structural issues

C. Faster project completion times

D. Enhanced aesthetic value

Improper site grading can lead to poor drainage and various potential structural issues, making this answer appropriate. Proper grading is essential to ensure that water flows away from the foundation of a structure. When grading is not done correctly, it can cause water to accumulate around the building, leading to problems such as flooding, erosion, and even foundation damage. Additionally, inadequate drainage can result in moisture-related issues like mold growth and can compromise the integrity of construction materials over time. These structural problems can complicate the construction process, result in costly repairs, and ultimately undermine the longevity and safety of the completed project. Grading is a critical first step in the construction process that lays the groundwork—literally and figuratively—for the overall success of a structure. In contrast, the other choices do not accurately reflect the primary consequences of improper site grading. While increased costs for materials may arise from subsequent repairs or mitigation efforts related to drainage issues, it is not a direct result of improper grading itself. Similarly, improper grading would not lead to faster project completion times or enhance aesthetic value, as these aspects would more likely be negatively affected by poor site preparation.

4. Which of the following is a defining feature of an inscribed angle?

A. Its vertex is outside the circle

B. It must be a right angle

C. Its vertex is on the circle

D. Its sides must be tangents

An inscribed angle is a specific type of angle formed when two chords in a circle share an endpoint. The defining feature of an inscribed angle is that its vertex lies on the circumference of the circle, which allows it to subtend an arc defined by the endpoints of the other chord. This position is vital since it leads to the fundamental property of inscribed angles: they measure half the angle of the arc subtended by the angle. Understanding this concept is crucial for various applications in geometry and surveying, where angles and their relationships to circles frequently come into play. The other characteristics mentioned in the options, such as having its vertex outside the circle or being a right angle, do not pertain to inscribed angles. Similarly, the requirement for the sides to be tangents describes a different type of angle known as a tangent angle, which further underscores why the position of the vertex on the circle distinctly defines an inscribed angle.

5. Which element is the controlling call in the description: N54°E for a distance of 298 ft to the shore of Wolf Creek?

A. N54°E

B. 298 ft

C. The thread of Wolf Creek

D. The shore of Wolf Creek

In the context of a property description, the controlling call refers to the element of the description that defines the limit or boundary of the property being described. In this case, "the shore of Wolf Creek" serves as the controlling call because it indicates the location to which the direction and distance (N54°E for 298 ft) are aimed. When surveying land, the boundary is often defined not only by angles and distances but also by natural features or man-made landmarks. The shore of Wolf Creek represents a definite physical boundary that is crucial for understanding where the survey ends—once that shoreline is reached, the survey or property description comes to a conclusion. The direction (N54°E) and distance (298 ft) offer guidance on how to navigate to that boundary, but they do not specify the endpoint in a way that conveys the finality of the boundary itself. Likewise, while the thread of Wolf Creek might also serve as a reference for the water's edge, it is the shore that delineates the property limit, making it the controlling element in this description.

6. What does the U.S. Constitution require before the power of eminent domain can be exercised?

A. The owner must be guaranteed adequate compensation for the property

B. The improvement must be for a public use

C. The owner may not be deprived of property without due process of law

D. All of the above

The U.S. Constitution, specifically the Fifth Amendment, establishes that no person shall be "deprived of life, liberty, or property, without due process of law." This means that before the government can exercise the power of eminent domain—essentially taking private property for public use—it must provide fair legal procedures and ensure that just compensation is offered to the property owner. Although adequate compensation and public use are also important aspects of eminent domain, the requirement of due process is foundational. It ensures that property owners have the right to challenge the taking of their property through proper legal channels, making it a critical element of the process. The other options involve components that are certainly part of eminent domain considerations, but due process is the fundamental requirement that ensures the rights of property owners are upheld during this process, thus making it the most essential aspect in the context of the question.

7. What is the area of a rectangle that measures 6 Gunter's chains and 5 Gunter's chains?

A. 3 acres

B. 5 acres

C. 7 acres

D. 10 acres

To determine the area of a rectangle, you multiply its length by its width. In this case, the rectangle measures 6 Gunter's chains in length and 5 Gunter's chains in width. The area in Gunter's chains is calculated as follows: Area = Length × Width = 6 chains × 5 chains = 30 square chains. Now, to convert square chains into acres, it is essential to know that 1 acre is equivalent to 10 square chains. Therefore, to convert 30 square chains to acres, you divide by 10: 30 square chains ÷ 10 = 3 acres. This confirms that the correct answer is indeed 3 acres, making it the appropriate choice. Understanding the conversion from square chains to acres is crucial in surveying, as it allows surveyors to express land area in more commonly understood units.

8. Which of the following is true regarding land ownership per the Statute of Frauds?

A. Ownership is limited to family members only

B. It must be transacted with written agreements

C. All types of transfer must be in writing

D. Title can be transferred verbally

The principle underlying the Statute of Frauds is that certain types of contracts, including those related to the sale or transfer of real estate, must be in writing to be enforceable. This requirement aims to prevent fraud and misunderstandings in land transactions by ensuring that there is clear documentation of the agreement. When it comes to land ownership, a verbal agreement lacks the tangible evidence needed to prove the terms of the ownership transfer or the intentions of the parties involved. Therefore, written agreements are not just beneficial but essential in land transactions to establish legal rights and obligations. While the other options touch on aspects of property and transactions, they do not accurately represent the legal requirements set forth by the Statute of Frauds regarding the necessity for written documentation in land transfers. It is crucial for anyone involved in real estate transactions to understand this principle to protect their interests adequately.

9. Which device typically defines the line of sight in modern surveying?

A. bull's-eye bubble

B. compensator

C. plumb bob

D. spirit level bubble

The device that typically defines the line of sight in modern surveying is the compensator. A compensator is an essential component in instruments such as total stations and theodolites, where it automatically adjusts for any tilt or angular misalignment of the instrument. This capability allows the surveyor to maintain an accurate line of sight to a target, even on uneven terrain. When the compensator is active, it ensures that the line of sight remains level, facilitating precise angle measurements and distance readings. The bull's-eye bubble, while helpful for leveling the instrument before taking measurements, does not actively maintain the line of sight during surveying. Similarly, a plumb bob is used to establish a vertical reference point but does not have any role in defining the horizontal line of sight. A spirit level bubble can assist in leveling the instrument but does not provide the dynamic corrections that a compensator offers for maintaining accuracy when measuring angles and distances.

10. What feature characterizes a site plan?

A. It includes statistical data for project bids

B. It visually represents the relationship of existing and proposed structures

C. It only focuses on underground utilities

D. It lists all resources needed for construction

A site plan is a detailed architectural drawing that provides a graphical representation of a specific piece of land, showing the relationships between existing and proposed structures, including buildings, roads, landscaping, and other physical features. This feature is crucial because it enables stakeholders—including engineers, architects, and planners—to visualize how the components of the project will interact with the surrounding environment and the existing structures. The emphasis on the relationship of various elements is key in site planning because it directly impacts zoning compliance, access, circulation, drainage, and overall functionality of the space. Understanding these relationships helps ensure that the proposed design integrates well with the site's context and adheres to regulatory requirements. Other options, while relevant in the construction and planning processes, do not accurately capture the primary function of a site plan. For example, while statistical data for project bids might be necessary for cost estimations, it is not a defining aspect of a site plan. Similarly, the focus on underground utilities might form part of a broader site development plan but does not encompass the full scope of what a site plan typically covers. Lastly, listing resources needed for construction pertains to project management rather than the spatial and visual representation that a site plan provides.