Fundamentals of Surveying (FS) Practice Exam (Sample)

Study Guide

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Questions

1. What type of error results from consistent deviations from the true value in measurements?

A. Random error

B. Systematic error

C. Blunder

D. Instrument error

2. What type of measurements can a surveyor’s level assist with?

A. Horizontal angles only

B. Vertical distances and elevations

C. Only distances

D. Both horizontal and vertical distances

3. By which process does a riparian or littoral owner gain title to new land?

A. Accretion

B. Avulsion

C. Erosion

D. Water level rise

4. What is the term "right of way" related to in surveying?

A. A right to construct buildings on land

B. A legal right to pass over someone else's land

C. A government claim over unregistered land

D. A method for measuring utility lines

5. Who owns land uncovered by reliction?

A. Public of the state

B. Federal government

C. Riparian or littoral owner

D. U.S. Department of the Interior

6. What type of data is primarily gathered in hydrographic surveying?

A. Soil composition and density

B. Underwater features and depth information

C. Air quality measurements

D. Population density statistics

7. Why is it important for surveyors to use specialized surveying software?

A. To reduce the overall project size

B. To facilitate compliance with zoning laws

C. To enhance capability in data analysis and presentation

D. To calculate market prices for properties

8. The purpose of a perpendicular bisector in surveying is to:

A. divide an angle into two equal parts

B. create a right angle

C. identify the center of circular arcs

D. measure distance accurately

9. The specifications for a survey require that the boundaries of a subdivision be referenced to the state plane coordinate system. You can obtain a list of control monuments and coordinates from the?

A. National Society of Professional Surveyors

B. National Bureau of Standards

C. National Geodetic Survey

D. Bureau of Land Management

10. Which of the following is not considered an essential of a deed?

A. A deed must be signed

B. A deed must be acknowledged

C. A deed must contain a description of the property

D. A deed must be recovered

Answers

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

Explanations

1. What type of error results from consistent deviations from the true value in measurements?

A. Random error

B. Systematic error

C. Blunder

D. Instrument error

Systematic error arises when there are consistent and predictable deviations from the true value in measurements. These errors can be traced to factors such as instrument calibration, environmental conditions, or procedural flaws, leading to a consistent bias in the results. For example, if a measuring instrument is improperly calibrated, all measurements taken with that instrument will consistently yield values that deviate from the true value in the same direction. Recognizing systematic errors is crucial in surveying because they can distort results and lead to misunderstandings if not accounted for. Unlike random errors, which are erratic and can occur in any direction without a predictable pattern, systematic errors require a thorough investigation of the underlying causes to mitigate their impact. Blunders refer to mistakes made during observation or measurement processes, often caused by human error, and are typically irregular. Instrument error refers specifically to inaccuracies inherent in the measuring tools. Random error, by nature, is unpredictable and varies in magnitude and direction with each measurement, which differs fundamentally from the consistent nature of systematic error. Thus, systematic error is the best choice, as it directly describes the scenario of consistent deviation from the true value.

2. What type of measurements can a surveyor's level assist with?

A. Horizontal angles only

B. Vertical distances and elevations

C. Only distances

D. Both horizontal and vertical distances

A surveyor's level is specifically designed to measure vertical distances and establish elevations. The instrument operates on the principle of leveling, which allows surveyors to determine the height of points relative to a reference level or sea level. By sighting through the level's telescope, surveyors can read the graduated staff held at the point of measurement, enabling them to calculate the difference in height between points and ensure accuracy in elevation measurements. The primary function of a level is to ensure a horizontal line of sight that helps in accurately gauging vertical differences, making it indispensable for tasks like establishing foundations, grading, and ensuring proper drainage in construction projects. This capability is fundamental in surveying and distinguishes it from other measurement tools that may focus on horizontal angles or distances. Therefore, when it comes to elevation and vertical measurements, a surveyor's level is the go-to instrument, confirming that the correct answer focuses on vertical distances and elevations.

3. By which process does a riparian or littoral owner gain title to new land?

A. Accretion

B. Avulsion

C. Erosion

D. Water level rise

Accretion is the process by which a riparian or littoral owner gains title to new land as a result of the gradual accumulation of sediment and soil by natural forces, such as the flow of water. When the watercourse gradually deposits material along the shoreline or bank, it enlarges the land owned by the property owner adjacent to that water body. This is significant because the owner gains title to the newly created land without having to take any legal action, as the law recognizes that the increases to their property were a result of natural processes. Other processes, like avulsion, refer to the sudden loss or addition of land due to events like floods or landslides, where ownership does not change hands simply or automatically. Erosion, in contrast, leads to a loss of land rather than gaining it, as soil is removed by water or wind. Water level rise might change the physical boundaries of land but does not directly confer ownership of new land to property owners; instead, it may require considerations of land rights and flooding. Therefore, the gradual nature of accretion facilitates the legal process by which riparian and littoral owners expand their land.

4. What is the term "right of way" related to in surveying?

A. A right to construct buildings on land

B. A legal right to pass over someone else's land

C. A government claim over unregistered land

D. A method for measuring utility lines

The term "right of way" in surveying is primarily associated with a legal right to pass over someone else's land. This concept is essential for various types of land development and infrastructure projects, including roads, railways, pipelines, and utility services. The right of way allows individuals or organizations to traverse private property for public or private purposes, ensuring that necessary pathways for transportation or utility installation can occur without the obstruction of land ownership issues. This understanding of right of way ties closely to easements, which grant specific use of land owned by another. For instance, if a municipality wishes to extend a road, it may need to obtain a right of way through adjacent properties, ensuring that the project can proceed while respecting property rights. Connecting this to the other options, the first option about constructing buildings on land refers to property rights that do not inherently relate to the access privileges implied by right of way. The third option involving a government claim over unregistered land does not align with the idea of passage since it pertains more to land ownership issues rather than the right to cross property. Finally, the method for measuring utility lines focuses on the technical aspects of surveying and does not encompass the legal rights associated with traversing land, which is the crux of the right of

5. Who owns land uncovered by reliction?

A. Public of the state

B. Federal government

C. Riparian or littoral owner

D. U.S. Department of the Interior

The correct answer pertains to the principle of reliction, which refers to the gradual and imperceptible uncovering of land that was previously covered by water, typically due to natural processes such as a reduction in the water level. In cases of reliction, the ownership of the newly exposed land is generally attributed to the riparian or littoral owner of the adjacent land. A riparian owner is an individual or entity that owns land bordering a body of water, such as a river or lake. When the water level decreases and land becomes uncovered, it becomes part of their property. This principle stems from property law and is grounded in the fundamental concepts of land ownership and rights associated with it. The rationale is that the owner of the land adjacent to water should have rights to the land that is revealed as the water recedes, preserving their property rights and the natural connection to the body of water. This principle contrasts with other options provided, such as ownership by the public, federal government, or specific departments like the U.S. Department of the Interior, which do not typically apply in situations of reliction. The rights to the newly exposed land remain with the riparian or littoral owner, emphasizing the continuity of ownership as natural conditions change.

6. What type of data is primarily gathered in hydrographic surveying?

A. Soil composition and density

B. Underwater features and depth information

C. Air quality measurements

D. Population density statistics

Hydrographic surveying focuses on the measurement and description of features that are found underwater, primarily in bodies of water such as oceans, rivers, and lakes. The correct choice highlights that this type of surveying gathers vital information about underwater features, which includes details about the depth of water, the shape of the seabed, and other critical geographical features such as submerged rocks, wrecks, and sedimentary structures. This data is essential for various applications, including navigation safety, environmental monitoring, and resource management. In contrast, the other options relate to different fields of study. Soil composition and density pertains to geological surveying, air quality measurements relate to environmental science, and population density statistics are associated with demographic studies. These do not align with the primary objectives or methods involved in hydrographic surveying.

7. Why is it important for surveyors to use specialized surveying software?

A. To reduce the overall project size

B. To facilitate compliance with zoning laws

C. To enhance capability in data analysis and presentation

D. To calculate market prices for properties

Using specialized surveying software is essential for enhancing the capability in data analysis and presentation, which is crucial for modern surveying practices. Such software allows surveyors to efficiently manage and analyze large volumes of spatial data, perform complex calculations, and visualize survey results through various mapping techniques. This capability not only improves the accuracy of the data but also enables surveyors to present their findings in a clear and professional manner, facilitating better communication with clients and stakeholders. Surveying often involves intricate calculations related to distances, angles, and elevations, and specialized software can automate these processes, reducing the likelihood of human error. Additionally, the software can provide tools for 3D modeling and visualization, helping surveyors produce diagrams and images that are beneficial for understanding and making decisions about land use, development, and other engineering projects. While other aspects like compliance with zoning laws or market price calculations are important considerations in surveying, they are not the primary reason for employing specialized software. The main advantage lies in the software's ability to enhance data analysis and presentation capability, which ultimately supports effective project delivery.

8. The purpose of a perpendicular bisector in surveying is to:

A. divide an angle into two equal parts

B. create a right angle

C. identify the center of circular arcs

D. measure distance accurately

The purpose of a perpendicular bisector in surveying is to identify the center of circular arcs. A perpendicular bisector is a line that cuts another line segment into two equal parts at a right angle. When applied to a circular arc, constructing the perpendicular bisectors of two chords of the arc will intersect at the center of the circle from which the arc is derived. This property is particularly useful in surveying when it is necessary to determine the precise location of the center of circular features, such as when laying out curves or ensuring that the layout adheres to certain design specifications. While the other choices relate to important concepts in geometry and surveying, they do not encapsulate the primary role of a perpendicular bisector as effectively as identifying the center of circular arcs does. Dividing an angle into two equal parts pertains to angle bisectors, creating a right angle relates to general perpendicular lines, and measuring distance accurately pertains to different measurement techniques rather than the specific action of a perpendicular bisector.

9. The specifications for a survey require that the boundaries of a subdivision be referenced to the state plane coordinate system. You can obtain a list of control monuments and coordinates from the?

A. National Society of Professional Surveyors

B. National Bureau of Standards

C. National Geodetic Survey

D. Bureau of Land Management

The correct answer is C. The National Geodetic Survey (NGS) is the entity responsible for maintaining the National Spatial Reference System (NSRS), which includes the state plane coordinate system. The NGS provides access to a comprehensive database of physical control points, which consists of horizontal and vertical control monuments along with their precise geographic coordinates. When a survey requires boundaries to be established based on the state plane coordinate system, the NGS offers the official data necessary to reference and validate these coordinates accurately. The other organizations, while involved in professional surveying in various ways, do not specifically maintain the control monument information associated with the state plane coordinate system. For example, the National Society of Professional Surveyors primarily serves as a professional organization for surveyors, not as a repository for geodetic data. The National Bureau of Standards, now known as the National Institute of Standards and Technology (NIST), focuses on standards and measurements across various fields but does not specialize in geodetic control. The Bureau of Land Management manages public lands and resource management, which includes land surveys but does not maintain the state plane coordinate control monuments data. Thus, the National Geodetic Survey is the authoritative source for the required control monuments and coordinates.

10. Which of the following is not considered an essential of a deed?

A. A deed must be signed

B. A deed must be acknowledged

C. A deed must contain a description of the property

D. A deed must be recovered

A deed is a legal document that conveys ownership of property and includes several key essentials to be considered valid. One of the fundamental requirements for a deed is that it must be signed by the grantor (the person transferring the property), which signifies their intent to transfer ownership. Additionally, a valid deed must have a clear description of the property being conveyed, ensuring that the specifics of what is being transferred are understood and legally enforceable. Acknowledgment refers to the formal declaration before a notary public or authorized official that the grantor freely executed the deed, which is often necessary for the deed's recording in public records, although it may not strictly make a deed valid in all jurisdictions. The term "recovered" does not relate to deed essentials. Instead, it seems to refer to a potential action concerning a deed's status or reinstatement, which does not align with the required components that establish a deed. Thus, recovery of a deed is not an essential characteristic in its formation.