HISTORY OF PUBLIC LANDS

PROBLEM 1
The first surveys of public lands in the United States were conducted under the provisions of which of the following laws?

(A) the Greenville Treaty
(B) the Act of February 11, 1805
(C) the Virginia Charter
(D) the Land Ordinance Act

PROBLEM 2
Which of the following authorities supervised the first surveys of public lands?

(A) the General Land Office
(B) the Department of the Interior
(C) the Bureau of Land Management
(D) the Geographer of the United States

PROBLEM 3
Thomas Hutchins was the surveyor in charge of the work now known as the Seven Ranges in Ohio, the first public land surveys done under the auspices of the Land Ordinance Act of 1785. He personally ran the line extending east and west from the Ohio River that is known as the Geographer’s Line. Lines that serve the same function as the Geographer’s Line are now found throughout the Public Land Surveying System. What are such lines called?

(A) sectional guide meridians
(B) guide meridians
(C) sectional correction lines
(D) baselines

PROBLEM 4
Rufus Putnam, the Surveyor General in 1797, established the contract system, which continued until 1910. Which statement best characterizes this system?

(A) The contract system provided for credit purchases of public lands by the highest bidders.
(B) The contract system allowed those wishing to purchase land within a township to make a deposit with the government to cover the surveying costs.
(C) The contract system abolished the credit system of purchase of public lands. Under the contract system, buyers were required to pay with hard currency.
(D) The contract system allowed the Surveyors General to arrange contracts with deputy surveyors for the execution of public land surveys.

PROBLEM 5
In 1807, Surveyor General Jared Mansfield ordered that another baseline be established 24 mi from the first in the Vincennes District to compensate for distortions in the survey. In 1818, the same idea was used to compensate for the effect of convergence. Which of the following terms is currently used to refer to such lines?

(A) correction lines
(B) guide meridians
(C) standard parallels
(D) both A and C

PROBLEM 6
In 1849, the General Land Office became part of the Department of the Interior. What department of government had jurisdiction over public land surveys before then?

(A) Department of Commerce
(B) Department of the Treasury
(C) Department of Agriculture
(D) Department of Defense
SOLUTION 1

Passed by Congress under the Articles of Confederation in 1785, the Land Ordinance Act established many elements of the Public Land Surveying System that remain virtually unchanged today. The Act created 640 ac sections (which were called lots) and 6 mi townships, and required that public lands be surveyed before they were sold.

The answer is (D).

SOLUTION 2

The General Land Office was proposed by Alexander Hamilton as early as 1790, but was not actually created until 1812. The office of the Surveyor General was first mentioned in the Act of 1796; the Bureau of Land Management did not begin until 1946. The office of the Geographer of the United States was created in the Land Ordinance of 1785. Thomas Hutchins was the first and only person to hold the office, and he conducted the first survey of the public lands in the United States.

The answer is (D).

SOLUTION 3

The baselines in the Public Land Surveying System are lines that follow a parallel of latitude from an initial point.

The answer is (D).

SOLUTION 4

From 1797 to 1910, public land surveys and the preparation of field notes were done by surveyors under contract with the General Land Office. These private contractors were generally paid per mile of line surveyed. The contract system was replaced by the direct system, which required that the surveys and resurveys be performed by government employees.

The answer is (D).

SOLUTION 5

From the beginning, the contradictory rules that townships be both 6 mi square and bounded by cardinal lines plagued the public land surveys. Compensation for convergence of meridians finally was addressed under instructions from Edward Tiffin for the survey in Indiana. The standard parallel, or correction line, was used.

The answer is (D).

SOLUTION 6

One of the initial purposes of the sale of public lands was to raise revenue. After the Revolutionary War, the United States had a great deal of land but little money. The sale of public lands provided a method for paying the huge foreign debt, among other things. Therefore, it was natural that the Department of the Treasury was in charge of the early public land surveys.

The answer is (B).

SOLUTION 7

Under the 1872 Mining Act, a patented lode claim is 300 ft on each side of the vein for a maximum length of 1500 ft.

The answer is (B).

SOLUTION 8

When the alignment of the governing east boundary of a township is irregular, the first meridional line west from the defective boundary is extended north to its intersection with the north boundary of the township. This line is called a *sectional guide meridian*. It allows the subdivision of the sections to its west in accordance with standard practice. East of the sectional guide meridian, fractional portions of the latitudinal section lines are placed in the east half-mile.

The answer is (A).

SOLUTION 9

One of the reasons for the eventual rejection of Thomas Jefferson’s proposal that the nautical mile be used in the public land surveys was that it was not evenly divisible into chains. The statute mile, equal to 80 chains, was preferred. Under this system, 10 sq chains is equal to 1 ac.

The answer is (B).

SOLUTION 10

Gunter’s chain is composed of 100 links. One hundredth of a chain is 1 link; therefore, 0.28 chain is equal to 28 links.

The answer is (D).

SOLUTION 11

A pole, also known as a *rod* or a *perch*, has a length of 16.5 ft. Therefore, a two-pole chain is a chain that is 33.00 ft in length.

The answer is (D).
**PROBLEM 67**

Centerline stakes set every 100 ft are standard for many types of route surveys; however, more closely spaced stakes are necessary under some conditions. Which of the following situations would likely require more closely spaced centerline stakes?

(A) When the intersection of one roadway with another occurs at a point other than a full station, a stake is often set at the point of intersection to indicate the stationing equation.

(B) When a route includes horizontal or vertical curves, stakes are set at the beginning and end of the curves, which seldom occur at full stations.

(C) When the requirements for a pipeline route call for a specified number of stakes per pipe length, the spacing is likely to be less than 100 ft between stakes.

(D) All of the above are true.

**PROBLEM 68**

Which of the following statements concerning the grading of stakes along a route survey is NOT true?

(A) The grade of a water line is generally more critical than that of a sewer line.

(B) Offset stakes or guard stakes are usually marked with cuts or fills, rather than centerline stakes.

(C) It is generally not necessary to turn through every stake that is to be graded.

(D) Grades for earthwork and pipelines are generally calculated to the nearest tenth of a foot.

**PROBLEM 69**

A blue top is a

(A) stake set at the catch point of the side slope of a template with the natural ground

(B) guard stake driven so its top is directly over the line stake

(C) control point monument located well away from the route being surveyed

(D) stake driven so its top is at the designed grade, or with the cut or fill to that grade written on the stake

**PROBLEM 70**

A shiner is a

(A) tack sometimes set in a line stake for more precise location than the stake alone provides

(B) hook from which a plumb bob may be hung in surveying tunnels and mines

(C) 1 in × 1 in stake, 12–18 in long

(D) nail set through a bottle cap or some other type of metal disk in a hard surface such as pavement

**PROBLEM 71**

A batter board is a

(A) horizontal board, usually 1 in × 6 in, nailed between two 2 in × 4 in posts that have been driven into the ground near a control point to prevent destruction of the point

(B) lath set to establish the clearing limits along a route

(C) pile that has been driven at an angle other than vertical; such piles are frequently used to brace others

(D) horizontal board, usually 1 in × 6 in, nailed between two 2 in × 4 in posts that have been driven into the ground across a trench or near a building corner

**PROBLEM 72**

Slope stakes are usually set to indicate the

(A) point where a roadway’s pavement ends and its side slope begins

(B) beginning of super-elevation along a highway curve

(C) point where a side slope intersects the natural ground

(D) maximum embankment allowed per the angle of repose
**SOLUTION 64**
The right angle offset method and the measured offset method rely on the establishment of a line parallel to the route of the survey. The equilateral triangle method and the equal angle method rely on the establishment of a point or points at known angles from the route.

*The answer is (D).*

**SOLUTION 65**
Astronomic observations are often used in long route surveys to correct for error accumulated in azimuths, or to quantify that error.

*The answer is (A).*

**SOLUTION 66**
Some route surveys extend for hundreds of miles. Depending on the accuracy required, surveys of such great distances should take the shape of the earth into account.

*The answer is (B).*

**SOLUTION 67**
These are only a few of the circumstances that call for stakes to be spaced to be more closely than every full station. In fact, it is rare that a route survey does not require at least some stakes set at odd stations.

*The answer is (D).*

**SOLUTION 68**
Generally, the grade of a sewer line is more critical since it relies on gravity flow.

*The answer is (A).*

**SOLUTION 69**
The term *blue top* is derived from the practice of marking the top of a stake driven to grade with blue keel. The term is also sometimes used for stakes marked for grade.

*The answer is (D).*

**SOLUTION 70**
It is not unusual for a route survey to cross areas where stakes cannot be driven; a shiner is one of several options for establishing the location of a point. A nail driven through an aluminum or other type of metal disk is convenient and permanent enough in most circumstances.

*The answer is (D).*

**SOLUTION 71**
Batter boards are used most frequently in the construction of pipelines and at building corners to provide grade and location. For a pipeline, a horizontal board, usually 1 in × 6 in., is established across the trench by nailing it between two 2 in × 4 in posts that have been driven into the ground. A nail is driven into the horizontal board at the centerline of the pipe. The top of the horizontal board is usually established at a whole number of feet above the grade of the pipe’s flowline. A wire or string stretched from nail to nail provides the reference for the location and grade of the pipe.

*The answer is (D).*

**SOLUTION 72**
Slope stakes are usually set where the cuts or fills necessary for the construction of a roadway or other route exceed approximately 3 ft. In such situations, the points at which the designed side slopes intersect the natural ground are indicated by slope stakes.

*The answer is (C).*

**SOLUTION 73**
The usual data written on a slope stake include the station of the stake, the cut or fill at the centerline, the distance of the stake from the centerline, and the ratio of the slope.

*The answer is (C).*

**SOLUTION 74**
The grade rod is the rod reading that would occur if the bottom of the rod was held precisely at the finished grade at the centerline.

\[
\begin{align*}
HI &= \text{elevation of the grade} = \text{grade rod} \\
&= 120.6 \text{ ft} \\
&\quad - 115.4 \text{ ft} \\
&= 5.2 \text{ ft}
\end{align*}
\]

*The answer is (D).*

**SOLUTION 75**
The first step in solving this problem is to find the difference between the grade rod and the ground rod.

\[
h = \text{grade rod} - \text{ground rod} \\
= 5.2 \text{ ft} - 1.1 \text{ ft} \\
= 4.1 \text{ ft}
\]