Chain surveying Notes

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Chain surveying Notes or chain surveying exercise:

Examine the following statements very carefully and identify whether they are true or false:

(a) Chain survey is a type of survey in which the survey is done with the help of a chain and tape only.

b) Chain lines can be measured with the help of a chain only.

c) Tie lines are generally extended outside the main triangle.

d)In an optical square the mirrors are placed at an angle of 60° to each other.

e) Right angles can also be set with the help of a chain and a tape.

f) The space between two parallel lines in the field book has no existence in the field.

g) Check lines are also tie lines.

h) Chain surveying is suitable for crowded cities

i) Gunter chain is most suitable for measuring areas

j) A chain survey is a class of survey in which a triangle is formed in the field whose sides are used as reference lines.

k)In Chain Survey angles are measured with considerable accuracy

L) The station are the points from which measurements are taken up to any object in the field

m) If the triangle is too big then it may be necessary to run few more straight lines within the triangle

n) It is not necessary for the tie Lines to touch any other tie line or main line

o) The main lines and the tie lines have common name known as chain lines

p) The offsets are also chain line measured up to different objects in the field

q) Comparing the plotted length of the tie lines on the map with the measured length in the field the accuracy of the survey may be determined

r) The start with as big a triangle as possible is formed and subsequently the area inside is subdivided by tie lines

s) Chain is used for measuring the chain lines and tape is used for measuring the offsets

t) The offsets should not be more than the full length of the tape measuring them

u) The ranging rods which are painted in red and white are used for fixing stations also

v) Arrows are used for aligning chain lines

Some questions about Chain surveying or chain surveying Notes:

- What is a ranging rod? Why it is painted in different colors?
- What is an optical square? Explain its working principle with neat sketch. What are the sources of error in an optical square? How can you detect them?
- Discuss the procedures of chaining when it is obstructed by a bend of a canal, a building, a pond and a bush. Show with sketches.
- What is reconnaissance survey? Why a sketch map of the plot to be surveyed is prepared?
- Write notes on : (a) Offset (b) Field Book (c) Cross-staff (d) Reciprocal Ranging (e) Stepping Method of Chaining (f) Well-conditioned Triangle (g) Sag Correction

Some mathematical problems about Chain surveying or chain surveying Notes for practice:

- The true length of a line was known to be 1500 ft. The line was measured with a 100 ft. tape and found to 1505 ft. Calculate the correct length of the tape. Ans: 99.66 ft.
- The distance between b two sub-stations was found to be 5305 ft. when measured by an engineers chain and 7946 links by Gunter's chain. Both the chains were incorrect. What correction is needed in the Engineers' chain if the Gunter's chain is 0.4 link too long Ans: 0.748 too short
- A draftsman measured a line on a map prepared by cbain survey by 1 inch= 80 ft. scale and found it to be 3200 ft. long on the ground. Later he discovered that he made a mistake and me scale was 1 inch=60 ft, Find the correct distance in his calculation. Ans: 2400.0 ft
- On a map covering an area of 2.5 sq. miles, the scale is by mistake recorded to be 12 inch=1 mile with the result that the area comes to be 4.sq. miles and 2844 sq. chains. Determine the correct scale of the map. Ans: 16 inches=1 mile
- A 103 ft. tape 13 suspended between its ends under a pull of 20 lbs. The wt. of the tape is 1.5 lbs. Calculate thds connected length cf the tape between its ends. Ans: 99.976 ft
- A survey was commenced at 7:30 A.m. when the temperature was 65°F with a 100 ft steel tape which was correct. After chaining a distance of 12650 ft. the work was suspended at 1:30 P.M. when the temperature was 102°F. Find the correct distance. Take the coefficient of expansion of steel =6.25 x 10-6" per deg. °F. Ans:12,652.92 ft. 16.
- A line was measured with a 20 m chain and found to be 98.4 m long. The chain was subsequently found to be 0.02 m too short. What was the correct measurement of the line ? Ans: 98.3 m
- Chaining along a slope the first 30 ft. were on a slope of 8° and the next 20 ft were on a slope of 5° What is the true horizontal distance ? Ans: 49.633 ft
- A chain line terminates at an inaccessible point D. Chaining is continued up to point B and a perpendicular BC is laid out 20 ft. in length. At C a right angle DCA is erected; A being on the chain Line. BA is measured and found to bo 8.62 ft. What is the distance from B to the inaccessible point D? Ans:46.4 ft.