**Practical No: 01** **Measure the distance between two inter visible survey stations using chain, tape and ranging rods.**

**I. Practical Significance:**

Measurement of length of line between two inter visible survey stations on flat ground for the planning or construction of any civil engineering projects.

**II. Industry/Employer expected outcome(s):**

- Marking the straight line on ground by using the eye observations and line ranger.
- Accurate measurement of length of line by using the tape or chain.

**III. Course Level Learning Outcome (COs):**

- CO 2- Undertake cross staff and compass survey for the given field.

**IV. Laboratory Learning Outcome (LLO):**

- LLO 1.1 - Find the distance between two given inter-visible points.

**V. Relevant Affective Domain related Outcome(s):**

- Using Safe behaviors effectively.
- Maintain high standards of hygiene.
- Efficient application of tools, equipment's and machinery.
- Professional and ethical standards.

**VI. Relevant Theoretical Background:**

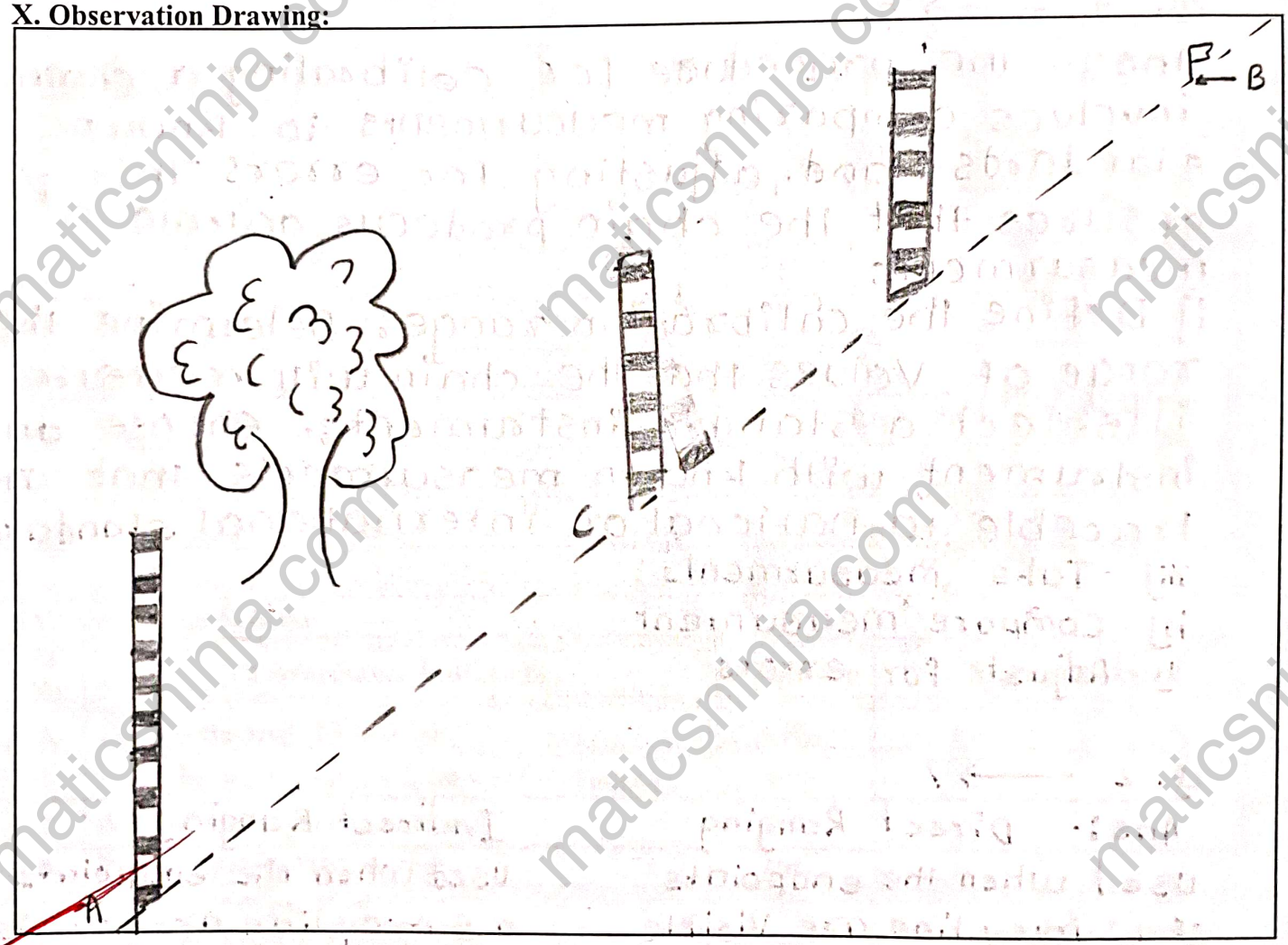
Direct ranging is done when the two end stations of the survey lines are inter visible. When these two survey stations are inter visible ranging can either done by eye observation or by any other optical instrument like line ranger etc. Ranging is the process of marking the straight line between two survey stations by fixing the intermediate ranging rods.

**VII. Required resources/equipment:**

| Sr. No. | Resource required | Particulars | Quantity |
|---|---|---|---|
| 01 | Metric Chain | 20m/30m | 2 nos. |
| 02 | Metallic or PVC tape | 15m/20m/30m | 2 nos. |
| 03 | Ranging rods | 2m length | 5 nos. |
| 04 | Pegs | Wooden/Steel | 2 nos |
| 05 | Arrows | GI wired | 4 nos |
| 06 | Line ranger | As per IS specification | 2 nos. |

4. The other assistant's will go and hold the ranging rod approximately on line AB.
5. The surveyor at A the signals the assistant's to move transverse to the chain line, till that assistant is in line with point A and B.
6. By using this procedure the further more line can range by the surveyor.
7. After the ranging of line measure the distance accurately.
8. After this collect all the instruments and return to the lab.
9. Draw the drawing of line with accurate measurements and with scale.

**X. Observation Drawing:**




**XI. Result:**

Distance AB is = 26.8

**XII. Interpretation of results:**

**XIII. Conclusions:**

- Horizontal distance between AB is = 26.8 m.

**XIV. Practical Related Questions:**

1. Explain the procedure of calibration of chain?
2. Distinguish between Direct and indirect ranging.

**Space for Answer**

Q. 1 ⟶ ?

Ans:- The procedure for celibrating a chain involves comparing measurments to known standards and adjusting for errors This proces ensures that the chain prodecus acurate measurments

i] Define the calibration range:- Determine the range of values that the chain will measure

ii] Select a standrd instrument:- Choose an instrument with known measurments that are traceble to national or International standards

iii] Take measurments

iv] Compare measument

v] Adjust for errors

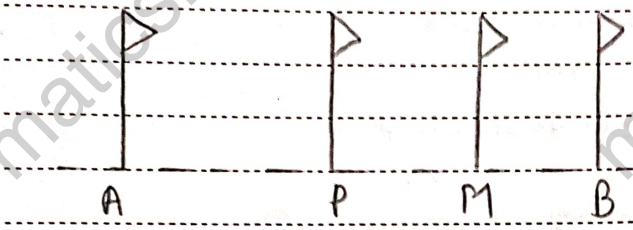
Q. 2 ⟶ ?

Ans:-

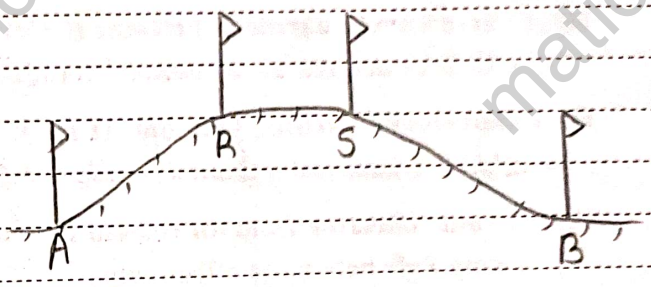
| Direct Ranging | Indirect Ranging |
|---|---|
| Used when the endpoints of a survey line are Visible to each other Ranging Can be done by eye or with an optical instrument like a line ranger or theodolite | Used when the endpoints of a survey line are not Visible to each other this Can be due to a long distance between the endpoints or high interveing ground. |

- Intermediate point are established on the line using sighting methods.

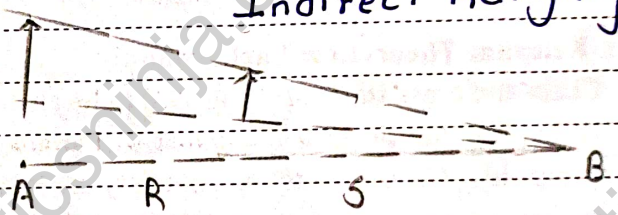
- Indirect ranging used two Intermediate points that can see each other and the end points to established points along the survey line.




Direct Ranging




Indirect Ranging




**XV. Assessment Scheme**

| Sr. No. | Performance Indicators | Weightage | Marks Obtained |
|---|---|---|---|
| **A.** | **Process Related (15 marks)** | **60%** | |
| 1. | Handling of equipment's & Survey Conduction | 40% | |
| 2. | Accuracy in length measurement. | 20% | |
| **B.** | **Product Related (10 marks)** | **40%** | |
| 3. | Conclusion of practical | 20% | |
| 4. | Practical Question Answer | 20% | |
| **C.** | **Total marks (25 marks)** | **100%** | |