

BASIC SURVEYING

BRANCH:- CIVIL / INTERIOR

SEMESTER – FIRST

These important questions have been prepared using your previous exam papers (PYQs), verified concepts, and additional reference from trusted online academic sources. For deeper understanding, please refer to your class notes as well.

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1 HIGH & LONG IMPORTANT QUESTIONS (90–95% Pattern Match)

1. **Leveling Numerical (Compulsory):** Given a set of staff readings (BS, IS, FS) for a leveling traverse, calculate the **Reduced Levels (RL)** of all points using **both** the **Height of Instrument (H.I.) Method** and the **Rise and Fall Method**. Clearly show the **Arithmetic Check** for both methods.
2. **Local Attraction Numerical:** Define **Local Attraction**. Given the observed Fore Bearings (FB) and Back Bearings (BB) of the lines of a closed traverse, **detect** the stations affected by local attraction and determine the **corrected bearings** of all lines. (This is a must-solve numerical).
3. **Principles & Errors:** State and explain the two fundamental **Principles of Surveying** ("Work from Whole to Part" and "Locate a Point by at least Two Measurements"). Why is working "**from Whole to Part**" considered essential? Differentiate between **Systematic Errors** and **Accidental Errors** encountered in surveying, giving two examples of each.
4. **Leveling Instruments:** Describe the construction and working of an **Auto Level** (or Dumpy Level) with a neat, labelled diagram. Explain the procedure for performing the **Temporary Adjustments** of the level (Setting up, Leveling, Focusing).
5. **Tape Corrections:** Explain the various **corrections** that must be applied to a measured length with a tape, detailing the formulas and application for **slope correction** and **temperature correction**.

2 IMPORTANT & SHORT QUESTIONS (50–70% Probability)

6. Differentiate between **Plane Surveying** and **Geodetic Surveying**. Give the **primary classifications** of surveying based on the **purpose of the survey** and the **instruments used**.
 7. Define **ranging**. Explain the procedure for **Direct Ranging** and **Indirect Ranging** with a suitable sketch.
 8. Define the terms: **Base Line**, **Check Line**, **Tie Line**, and **Tie Station** used in chain triangulation. Differentiate between **Perpendicular Offsets** and **Oblique Offsets**.
 9. Describe the various **components and functions** of a **Prismatic Compass** with a neat sketch.
 10. **Bearings Conversion**: Convert the following bearings from one system to the other:
 - **WCB** 235 degree 15' to **Reduced Bearing (RB)**.
 - **RB** N 35 degree W to **Whole Circle Bearing (WCB)**.
 11. Define the following levelling terminologies: **Datum**, **Bench Mark (GTS, Permanent, Arbitrary)**, **Back Sight (BS)**, **Fore Sight (FS)**, and **Change Point (CP)**.
 12. Explain how to calculate the **interior angles** of a closed traverse when the **Fore Bearings** of all lines are known.
 13. Write a short note on **Magnetic Dip** and **Magnetic Declination**.
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3 “AA BHI SAKTA HAI” QUESTIONS (Low Probability but Smart Picks)

- 14.
15. Write a short note on the application of **EDM (Electronic Distance Measurement)** and **Rodometer** in modern surveying.
16. Explain the method of **chaining on sloping ground** using the **Stepping Method**.
17. Briefly explain the procedure for finding the distance between **two non-inter-visible survey stations**.
18. Briefly describe the **responsibilities of a surveyor** and career progression provisions.
19. Differentiate between **Open Traverse** and **Closed Traverse** in compass surveying.
20. Explain the difference between a **Level Surface** and a **Horizontal Surface**.

QUICK REVISE

I. UNIT-1: INTRO & FUNDAMENTALS

Topic	Chat/Hinglish Notes
Surveying Kya Hai?	Simple words mein, zameen ya uske neeche ke points ka relative location pata karna. Goal: Map ya plan banana.
Main Rules (Principles)	1. Pehle Poore Area ko dekho, phir chote parts mein kaam karo (Work from Whole to Part): Isse errors ek jagah ikatthe nahi hote. 2. Ek point ko confirm karne ke liye kam se kam do measurement lo (Locate a Point by at least Two Measurements): Taaki accuracy check ho sake.
Types of Surveying	1. Plane: Chote area ke liye (curvature ignore karte hain). 2. Geodetic: Bade area ke liye (Earth ka curvature consider karte hain).
Errors	1. Mistakes: Jaise reading galat le li, ye gross errors hote hain. 2. Systematic Errors: Hamesha ek hi direction mein hote hain, inko formula se theek karte hain (e.g., tape chota hai). 3. Accidental Errors: Random hote hain, khud adjust ho jaate hain.

II. UNIT-2: CHAIN SURVEY

Topic	Chat/Hinglish Notes
Instruments	Chain/Tape: Distance naapne ke liye. Ranging Rod: Line straight karne ke liye. Offset Rod: Perpendicular distance lene ke liye.
Ranging (Line Straight Karna)	1. Direct: Agar dono end points dikh rahe hain. 2. Indirect (Reciprocal): Agar beech mein pahadi ya koi rukawat hai, toh do intermediate points se karte hain.
Chain Triangulation (Fields ko Divide Karna)	Base Line: Sabse lambi aur main line. Check Line/Proof Line: Pura kaam sahi hai ya nahi, ye check karti hai. Tie Line: Andar ke small details (jaise ped, khamba) locate karne ke liye.

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Topic	Chat/Hinglish Notes
Offsets	Perpendicular Offset: 90 degree pe lete hain (Most accurate). Oblique Offset: 90 degree se alag angle pe lete hain (Jab object door ho).
Important Corrections	Slope Correction: Agar zameen tirchi hai, toh yeh hamesha subtract karte hain (distance kam ho jaata hai). Temperature Correction: Agar temperature standard se alag hai.

III. UNIT-3: COMPASS SURVEY 🌟

Topic	Chat/Hinglish Notes
Bearings (Angles)	True Meridian: Earth ke poles wala. Magnetic Meridian: Compass ki needle wala. True Bearing (TB): True Meridian se angle. Magnetic Bearing (MB): Magnetic Meridian se angle.
Bearing Systems	1. WCB (Whole Circle Bearing): North se Clockwise pura 0 degree se 360 degree . 2. RB (Reduced Bearing): North ya South se start, sirf 0 degree se 90 degree .
Prismatic Compass	Ismein Prism hota hai, jo aapko simultaneously reading lene aur target ko dekhne deta hai. WCB system mein reading deta hai.

IV. UNIT-4: LEVELLING (VERY IMPORTANT FOR NUMERICALS) ✨

Topic	Chat/Hinglish Notes
Main Terms	Datum: Reference level (RL). Bench Mark (BM): Fixed reference point (RL already pata hai). BS (Back Sight): Pehli reading (RL pata hoti hai). FS (Fore Sight): Aakhri reading (Instrument shift karne se pehle).

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Topic	Chat/Hinglish Notes
	CP (Change Point): Jis point par \$FS\$ aur \$BS\$ dono lete hain.
RL Calculation Methods	Yaad Rakho: Ye Numerical! 1. H.I. Method (Height of Instrument): $H.I = RL + BS$ $NEW RL = H.I - FS / IS$.
Auto Level	Sabse common instrument. Ismein compensator hota hai jo line of sight ko auto-level kar deta hai.

Best of luck for your exams! I hope these quick notes help you revise fast!

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