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Best Quality Classroom Topper Hand Written Notes to Crack GATE, IES, PSU's & Other Government Competitive/ Entrance Exams

MADE EASY CIVIL ENGINEERING Surveing BY-Asish Sir

- Theory
- Explanation
- Derivation
- Example
- Shortcuts
- Previous Years Question With Solution

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SYLLABUS

GATE → 6-7 marks

ESE

Prelims → 15 Questions ≈ 30 Marks
Mains → ≈ 65 Marks

10% weightage

20% weightage

97% to be covered
in the class

Remaining 3% to be
covered by yourself

by
Made Easy App
(Pdf + video)

1) Fundamental Concepts

2) Linear Measurements &
Chain survey

3) Compass survey ***

4) Traverse survey ** Horizontal Plane

5) Levelling Work ***

6) Contours & Area-Volume

7) Trigonometrical Levelling *

8) Tacheometry survey Vertical Plane

Data collection

9) Curves ← (Data Establishment)

10) Errors & Accuracy

11) Photogrammetry *** ← (Data collection)

① Plane Table Survey

&

Triangulation

② GPS/GIS/Remote Sensing / Time Concept

↓

Past of
Astronomy survey

③ Instruments

~ SURVEYING ~

[Ashish Kumar Sir]

11/04/26
.....

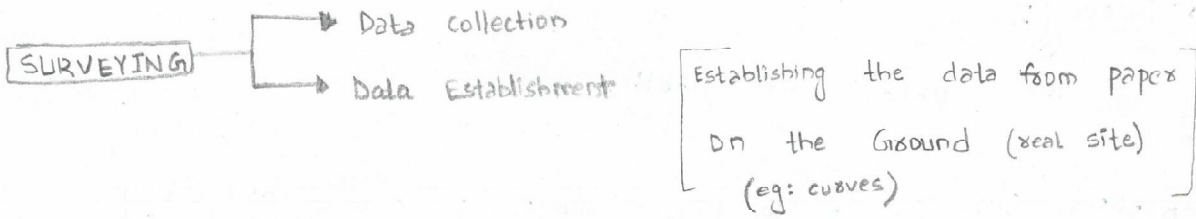
[A/B/C Batch of 2026]
(1st)

HOMEWORK

- ✓ 11/April → Chain surveying Instruments & Compass
- ✓ 12/April → Theodolite (upto temporary adjustment)
- ✓ 13/April → Theodolite (Finish full topic)
- ✓ 14/April → EDM I
- ✓ 15/April → All other instruments
- ✓ 16/April → Plane table surveying & Triangulation
- ✓ 17/April → GPS/GIS/Remote sensing
- ✓ 18/April → ~~Rest~~ Rest Remaining

1

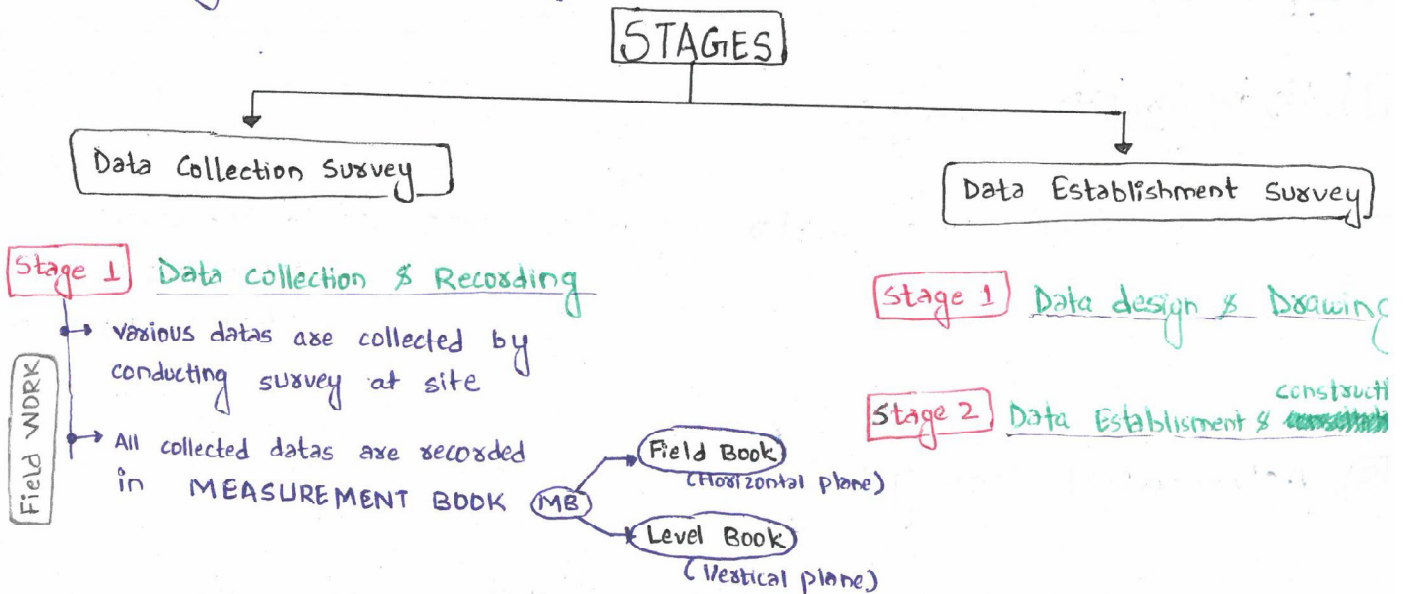
FUNDAMENTAL CONCEPTS



→ Survey is the art of determining relative positions of points through direct or Indirect measurements of Distance, direction & Elevation [Data Collection]

→ It also includes establishment of points to the ground which are predetermined to paper [Data Establishment]

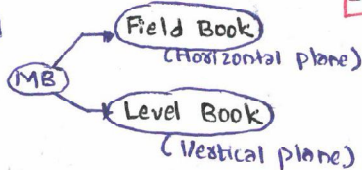
* Stages for Survey



Stage 1: Data collection & Recording

- Various data are collected by conducting survey at site
- All collected data are recorded in MEASUREMENT BDK

Field WORK



Stage 1: Data design & Drawing

Stage 2: Data Establishment & Construction

Stage 2: Data Correction & Plotting

- All recorded data are corrected for various corrections.
- Finally corrected data are plotted with suitable scale (map making)

Office WORK

* Classification of Data Collection Survey:

1] Land Survey:

→ Survey to the surface of Earth.

(a) Topographical Survey: → To know about general topography of area. such as

- Rivers
- Ponds
- valley
- Roads
- Rails
- Buildings etc.

(b) Cadastral Survey: → To know about property lines. such as

- state boundary
- District Boundary
- Municipal boundary etc.

(c) City Survey: → To provide various services in a city such as

- Road Network
- Metros
- water supply
- sewer pipelines etc.

2] Hydrographic Survey:

2] Hydrographic Survey:

→ To know about under water features. such as

- Bed Level
- Aquatic plants
- Aquatic animals etc.

3] Astronomical Survey:

→ To know about position of stars, planets, Moons, etc.

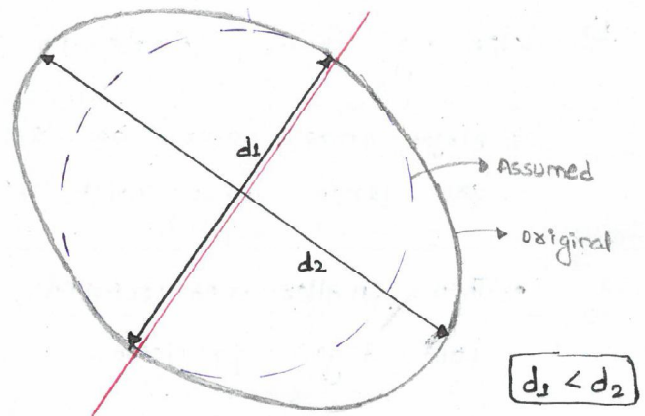
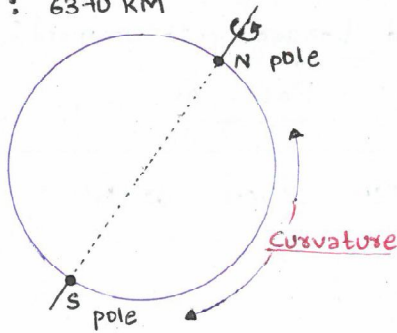
NOTE:

* Archaeological Survey:

→ To know about antique substances.

* EARTH :

- shape : Assumed Spherical
- Radius : 6370 KM



Curvature \equiv **Geoid**

- from coast to MSL
- Diff. countries has diff. MSL (30 Yrs Data)
- India \rightarrow Mumbai MSL (19 Yrs data)

Geodatic survey

Plane survey

- \rightarrow When curvature of Earth is considered
- \rightarrow Suitable for Large Area

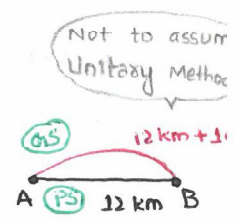
- \rightarrow When curvature of Earth is NOT considered.
- \rightarrow Suitable for small Area

NOTE:

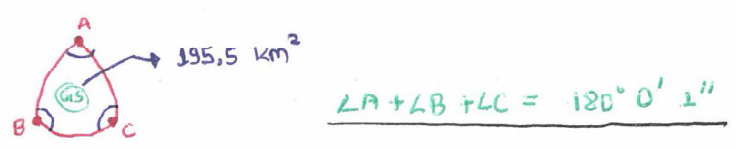
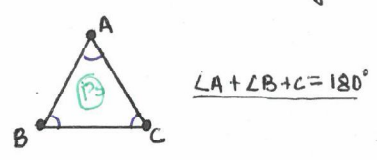
\rightarrow Generally Geodatic survey is considered for an Area more than 250 km². (suggestion, not Rule)

Observations:

(a) For 12 km of distance measurement in Plane survey. Geodatic ~~survey~~ distance will be just 1 cm extra.



(b) For triangle of Area 195.5 km² in Geodatic survey. Sum of internal Angle will be just 1 second (1'') extra.



* Principles of Surveying:

1) Working from Whole to Part.

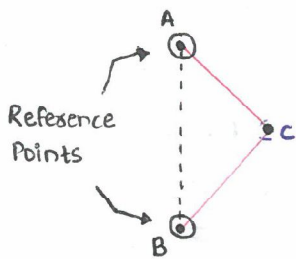
- Major control points are selected and larger measurements are taken first with high degree precision.
- Then smaller measurements are taken even with low degree precision.

advantage: ① Prevention of accumulation of errors from small to large

② Errors of smaller measurements are localised in smaller only.

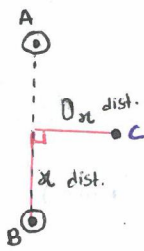
2) Location of a point w.r.t. 2 Reference points a minimum

- Any point can be established exactly to the ground if we have at least 2 reference points available as below.



Chain Method

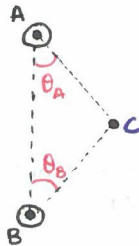
[Distance]



Offset Method

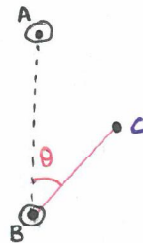
(Part of chain) method

[Distance]



Compass Method

[Angle]



Traverse Method

[Distance + Angle]

~~Minimum~~

* Error and Correction :

(a)
$$\text{Error} = \left[\underset{\substack{\text{M.V.} \\ \text{Measurement taken} \\ \text{at site}}}{\text{Measured Value}} - \underset{\substack{\text{T.V.} \\ \text{Exact value of} \\ \text{Quantity}}}{\text{True Value}} \right]$$

- if $MV > TV$ [+ve Error]
- if $MV < TV$ [-ve Error]

(b)
$$\text{Correction} = \left[\underset{\text{T.V.}}{\text{True value}} - \underset{\text{M.V.}}{\text{Mes. Value}} \right]$$

- if $TV > MV$ [+ve correction]
- if $TV < MV$ [-ve correction]

$$\text{Correction} = -\text{Error}$$

(c)
$$\text{Corrected value} = \left[\text{M.V.} + \text{correction} \right]$$

(or)
$$\text{True Value} = \left[\text{M.V.} + \text{correction} \right]$$

(with sign)

SURVEYING INSTRUMENTS



Index

1. Chain Survey instruments
2. Compass
3. Theodolite
4. EDM I
5. Some other instruments

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