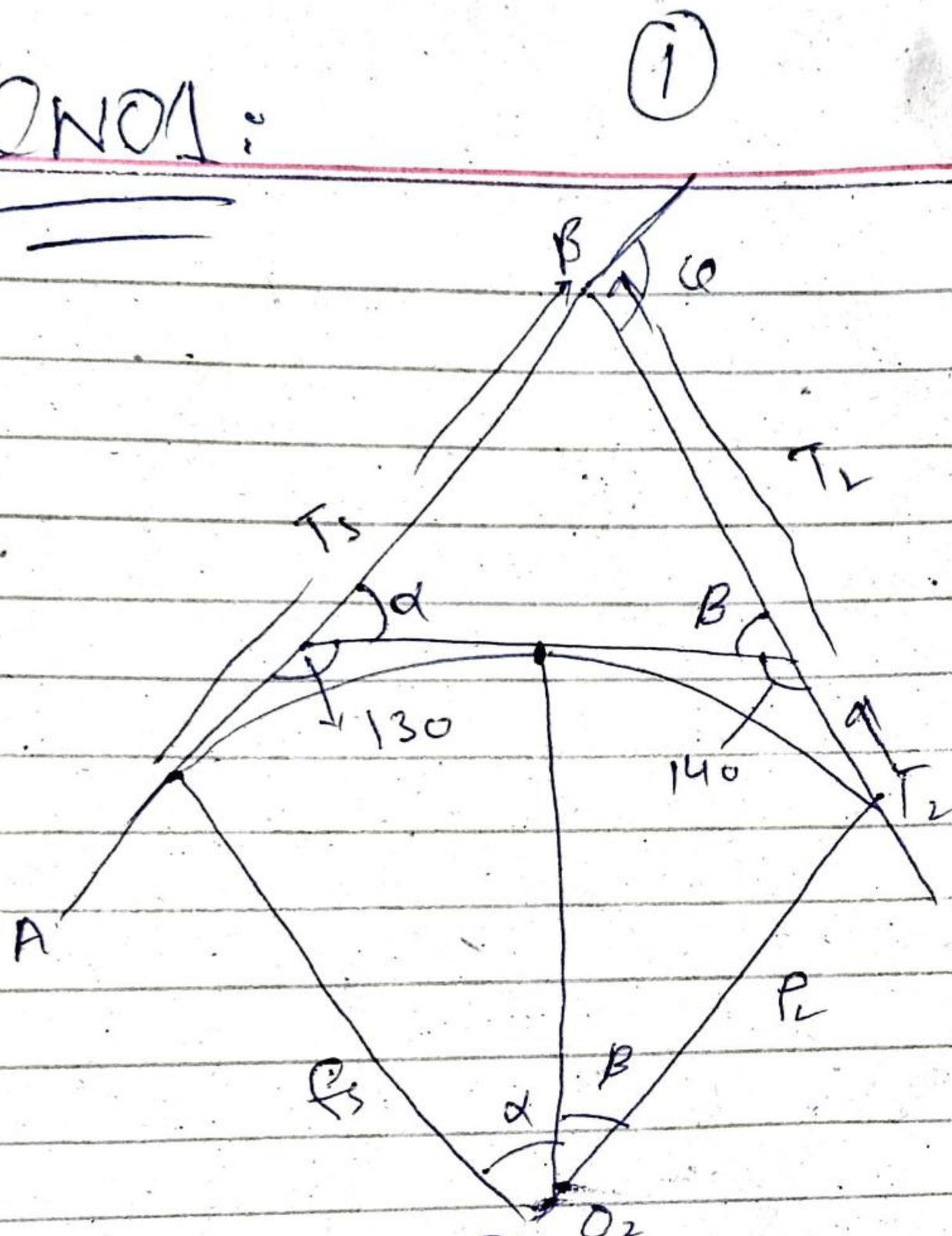
Name = Fawad Ahmad

ID = 7783.

Subject = Survey 2.

CONO1:



(02)

Q = NO 1

⇒ Given data:

Angle AKm = 130°

Angle KMC = 140°

Radius of 1st Arc = 7783 − 300 = 7483 m.

Radius of 2nd Arc = 7783 − 200 = 7583 m

Intersection point = 7783 − 400 = 7383 m.

Solution:

$\alpha = 180° - 130° = 50°$

$\beta = 180° - 140 = 40°$

$\phi = \alpha + \beta = 50 + 40 = 90°$

$I = 180° - 90° = 90°$

$KT_1 = KN = R \tan(\alpha/2) = 7483 \tan(50°/2)$

3610.6m

$MN = MT_2 = R_2 \tan(\beta/2) =$

$7583 \tan(40°/2) =$

2759.9m.

$\Rightarrow KM = KN + MN = 3610.6 + 2759.9 =$

6370.5m

⇒ Find BK and BM by Sin Rule.

$= BK = \frac{MK \sin\beta}{\sin(I)} = \frac{6370.5 \cdot \sin(40°)}{\sin(90°)}$

$=$ **4094.8m**

$$= BM = \frac{MK \sin\alpha}{\sin(I)} = \frac{6370.5 \times \alpha \sin(50/2)}{\sin(90^\circ)}$$

$$BM = \boxed{2692.2 \text{ m}}$$

$$= T_L = LCT_1 + BLC = 3610.6 + 4084.8$$

$$= \boxed{7705.4} \text{ m}$$

$$= T_S = MT_2 + BM = 2758.8 + 2692.2$$

$$= \boxed{5452.1} \text{ m}$$

$$L_L = \frac{\pi R_L \alpha}{180^\circ} = \frac{3.14 \times 7483 \times 50^\circ}{180^\circ}$$

$$L_L = \boxed{6526.8.}$$

$$L_S = \frac{\pi R_S \beta}{180} = \frac{3.14 \times 7583 \times 40^\circ}{180^\circ}$$

$$L_S = \boxed{5291} \text{ m}$$

Intersetion point is 7383.

P.I T_L = 7383 − 7705.4

= −322.4 m.

Change of T_1 = 7188.62m.

Chaye of $T_1 + L$ = 7188.62 + 6526.8 −

= 13715.42

Nord chaige of Compound Curve.

$+ L_S$ = 13715.4m + 5291.5

= 19006.9

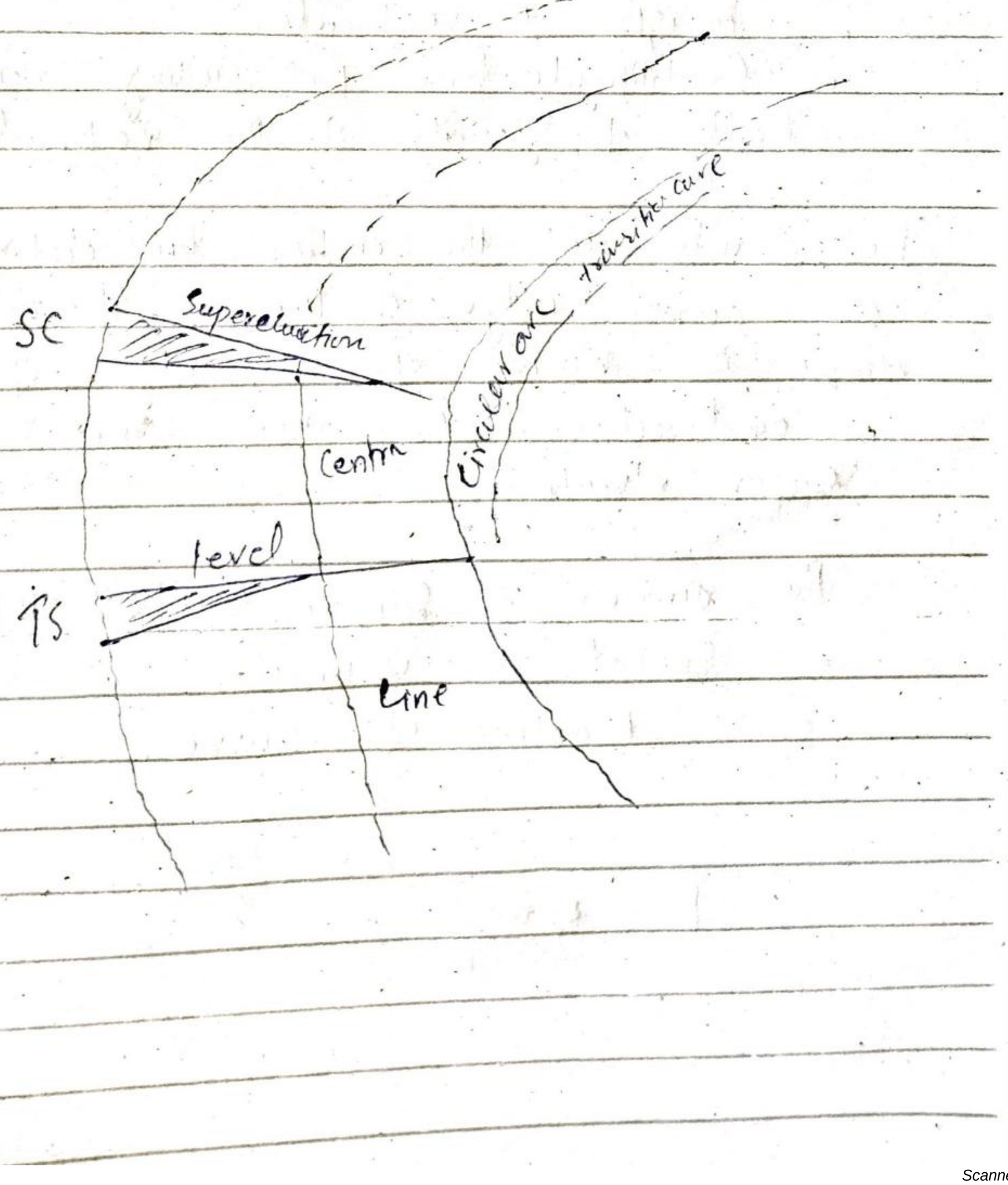
Chag of T_2 = 8051.63m

Q NO =>

What is transition Curves-?

A Curve of varying radius is called a transition Curve, it is also called Spiral Curve or Easement Curve.

=> It is used on both highway & railway between tangent and Circular Curve in order to have smooth transition form tangent to be Curve and form Curve to the tangent.



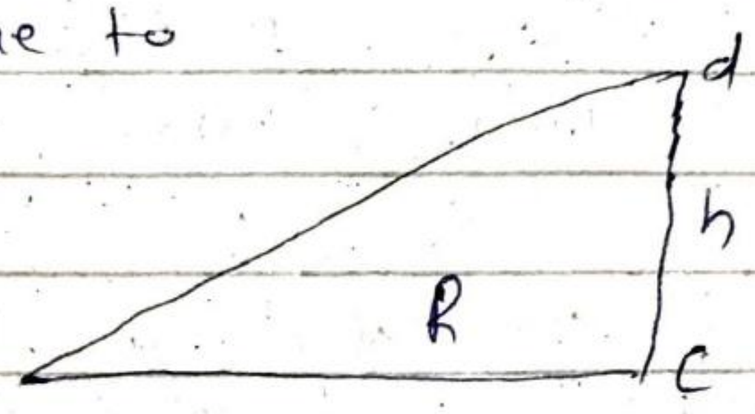
Super elevation.

let

v = Speed of vehicle m/s

g = Accelaration due to gravity m/s2

b = width of road, m



When vehicale more form tangent on the the curve the force acting on it are

- weigth of vechicale.
- Centrifigule force, Both acting Through the Centre of gravity of the vehicale).

To Counter act the action The outer rail or outer edge of the road is raised above the raising of outer adge of rail or road above the inner One is called Super elvation.

The amount of Supper elvation depend upon

- Speed of vehicals
- Radius of curve.

$$P = \frac{mv^2}{R}$$

$$P = \frac{mv^2}{R} = \frac{wv^2}{gR} \quad \because w = mg$$

$$\frac{P}{w} = \frac{v^2}{gR}$$

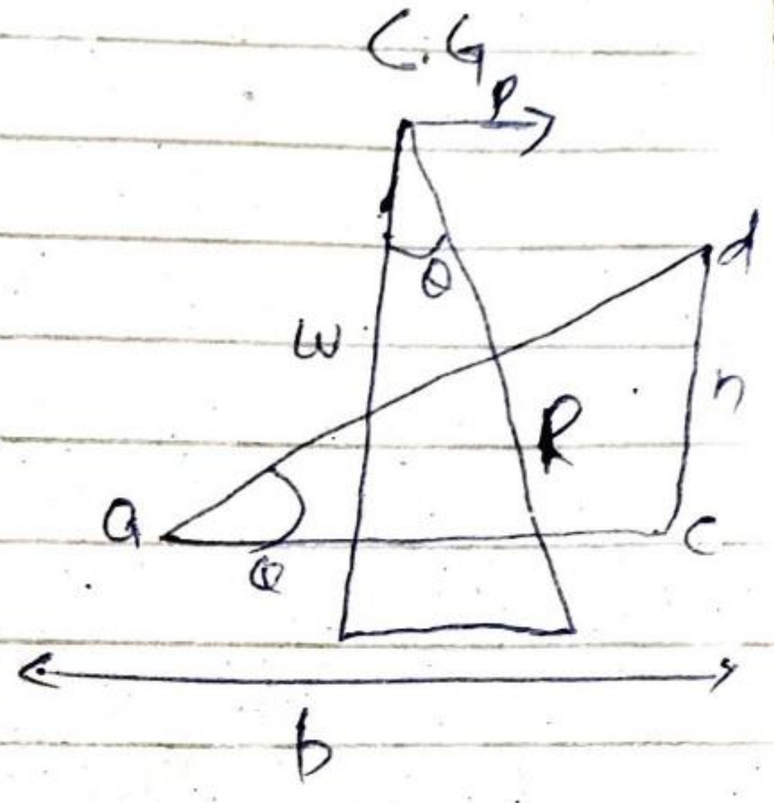
$$\tan\theta = \frac{h}{b} = \frac{dc}{ac} = \frac{P}{w}$$

$$\tan\theta = \frac{h}{b} = \frac{P}{w} = \frac{v^2}{gR}$$

$$h = b\tan\theta$$

$$h = \frac{b\,v^2}{gR} \longrightarrow \text{on highway.}$$

$$h = \frac{b\,Gv^2}{gR} \longrightarrow \text{on railway}$$



Where G = Distance b/w the centre of rail

Super elevation is gradually applied along a transition curve. Full super elevation is attained at junction of the transition curve with circular curve.

QNO 3

Defference between Triangulation & Trilateration.

Triangulation:-

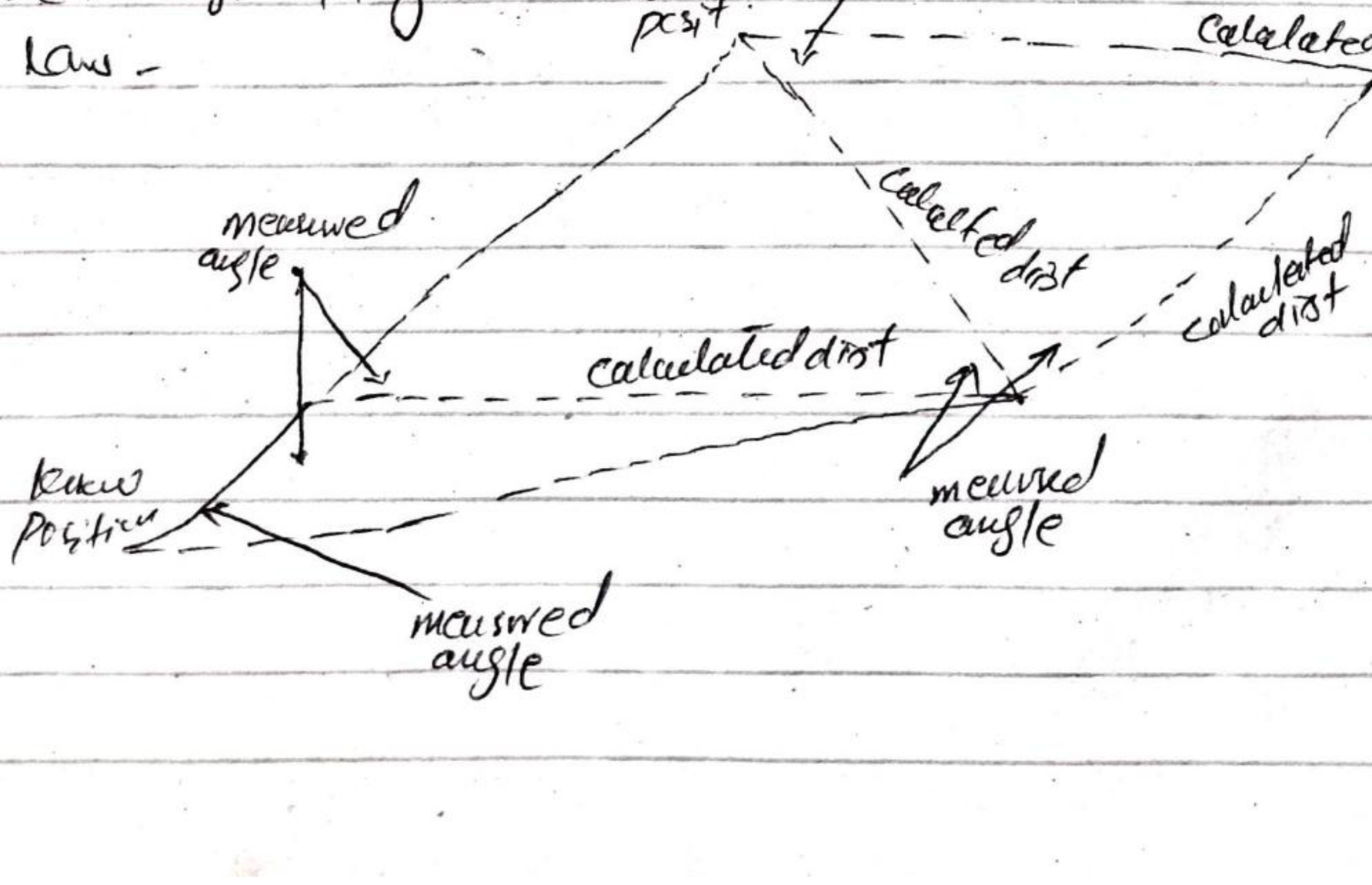
=> As martin has said, in triangulation you work with angle as illustrated-

=> The position of the point of interest are computed based on meaured angle & two know points-

=> Those angle the distance are computed which are in turn used to calculated Coordinates for the target point.

=> Trangulation consist of number of number of interconnected tangle in which the length of only one base Line & the angle of the traingle are meaursed very precisely which are used calculate the Cordinate of verticales-

=> the side length are computed on the basis of meaursed angle apply sine Calalated / meaursedangle Laws -



Trilateration:

⇒ In trilateration, you work with distance, form those distance you compute the angle. Once computed, you can use them in conjunction with the distance to get the position of the target point.

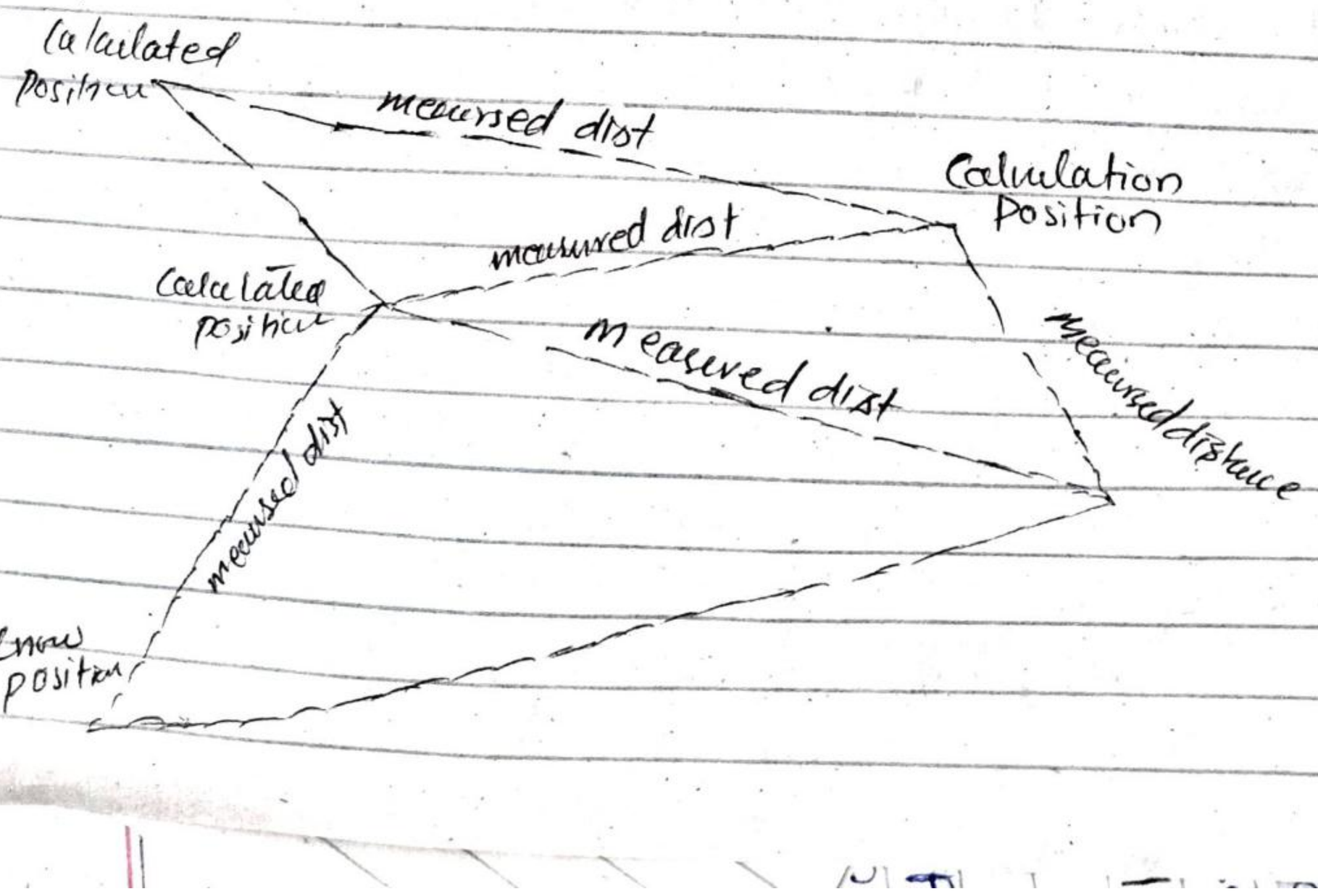
⇒ For small area its possible to measure distance without interesibility.

⇒ The angle of are computed on the basis of measured side length applying Cosine-law-

⇒ Azimuth of the Initial Line is measured-

⇒ Some check angle are measured to control Azimuth error-

⇒ All the sides are measured in trilateration-



Principle of triangulation:

⇒ All the three angle and the length of one side of a triangle are known, Then by trigonometry of length of the remaing side of the triangle can be calculated-

⇒ Again, If the coordinated of any vertex of triagle & azimuth of any side are also known, Then the coordinate of the remaining vertices may be computed-

Principle of trilateration:

⇒ trilateration a highly accurate and precise method of establishing & expanding horizontal control.

⇒ Method control survey which a network of tringle is used in triangulation system.

⇒ All the Three side of each tringle are measured in the field with the distance measuring instrument (EDM) taper other apparatus)

⇒ Horizontal angle are not measured in the field-

⇒ Few new horizontal angle are also sometime measured to provide to check on computed angle -

⇒ vertical angle are also measured where elvation have not been established.

=> Principle of trarguleation

Sin Rule

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(c)}$$ (for finding side)

$$\frac{\sin(A)}{a} = \frac{\sin(B)}{b} = \frac{\sin(C)}{c}$$

for finding Angle.

=> Principle of trilateration.

Cosine Rule:

$$a^2 = b^2 + c^2 - 2bc\cos A$$

$$2bc\cos A = b^2 + c^2 - a^2$$

$$\cos A = b^2 + c^2 - a^2 / 2bc$$

$$A = \cos^{-1}\left[\frac{b^2 + c^2 - a^2}{2bc}\right].$$

NO4

aparts:- What is hydrographic Survey?

=> It is . The branch of Surveing which deal with water bodies e.g lake , river etc.

=> The usual fundamental principle of Surveying & leveling are adopted for acquiring data for determination of.

(i) water Volume.

(ii) Rate of Flow

(iii) To determine the shape of the area underlying the water surface etc.

Why we do it

=> To determine the quantities of subqueous excavation.

=> measure area subjected securing or silting in harbour or docks.

=> locate rock and other object such as buoys , light etc to aid safe navigation.

=> To develop water, resource for power irigation and recreation.

=> Control floods, and to plan water supply & storage from rivers..

(2)

Factor of Hydrographic Survey.

=> To measured of depth of water at various point is termed as sounding.

=> Depth of sounding is referred to the water level at the time at b made.

=> Therefore, the are reduced to datum water level, to accunt for tidal water which undergo continual change of elevation, with the help of gauge.

=> The field work consist of both navigational as well as vertical control.

=> The navigational control established by traversing or triangulation.

=> For vertical control, the tide guage are kept in operation continously since the water level at that guage must also be known when sounding are recorded.

Q no 4

Bparts: Sounding & purpose of Sounding-

Sounding:

=> The process of determining depths below the water surface is called Sounding-

=> Sounding is analogous to ✪ Levelling on land-

=> The reduced level of any point on the bottom of a water body is obtained by subracting the Sounding from the mean Sea Level-

Purpose of Sounding.

is Preparation of accurate Charts for navigation.

(2) Determination of the quantities of the material to be filled-

(3) Obtaining information for design of breakwater, Sea well etc-

Name of equipment -

(1) Sounding boat.

(2) Sounding pole or rod.

(3) Echo Sounding machine / Fathometer

(4) Weddell's Sounding machine -

(5) lead Line.

Q no 5

(a) parts: What is arial photogrammetry and why we do it -

Arial photogrammetry consist of using the Imagery gathered in the air by UAVs to create computer - generated 2D & 3D models. These model are topographical in nature, meaning they represent the dimension & physical feature of the area of land & in stunning accuracy. These model can be rotated and zoomed.

➡ Why we do it

Photogrammetry is field such as topographic mapping, architecture, engineering, manufacturing, quality control, police investigation, cultural & geology.

Photogrametry use Computer Science to help people accomplish great and we are happy that so many industrial trust to keep getting the job done.

Q.NO 5

Q parts: Shortly Explain the procedure of aerial photography.

Aerial photography, technique of photographing the earth's or surface or feature of its atmosphere or hydrosphere with cameras mounted on aircraft, rockets, or earth-orbiting satellites and other spacecraft.

Each photograph depicts an area that includes several control point, the location of which are determined by ground-surveying techniques. It is means fixing time within the framework of space.