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Question No # 1

Answer:-

We will explain transition curve & is super elevation is effected by speed of vechicles.

TRANSITION CURVE:-

A curve of varying radius is called transition curve b/w tangent & a circular curve. It is also known as spiral curve It can be inserted in b/w the two branches of a compound

or reverse curve

TYPES:

These are three common types of transition curves which are given below.

i) Cubic Parabola → Railways
ii) Clothoid or spiral → Railways
iii) Lemnes Scale → High way

SUPER ELEVATION:

It is the amount by which the outer edge of a curve on a road or railway is banked above the irrer edge when a vehicle passes to a curved

Path. The following forces acts on it.

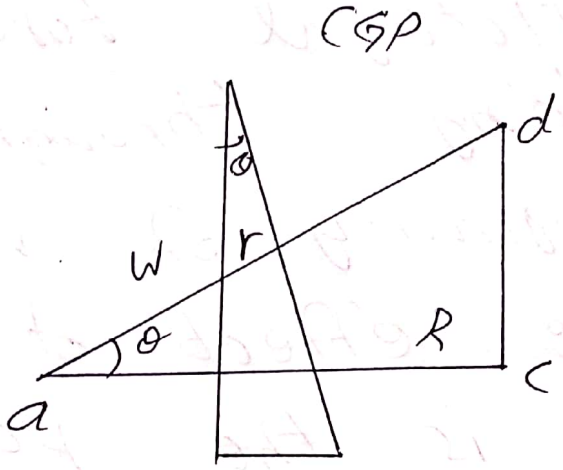
i) Weight of vehicle.

2) Centrifugal forces both acting through centre of gravity of vehicle.

↳ The effect of centrifugal force is the push the vehicle off the track. Now to contract the action, the plane of the road surface is made perpendiculars to resultant of centrifugal force and weight of vechile. In other side the outer bank of road is raised

above the inner one is known as Supperelevation.

MATHEMATICALLY:-



W = Weight of vehicle

P = Centrifugal force

V = Speed of vechile m/sec

g = acceleration due to gravity

R = Radius of curve

h = Super elevation in m.

b = width of road in m

G = Distance b/w Centre of rails.

For equilibrium the resultant of weight and centrifugal force must be equal and opposite to the reaction perpendicular to road.

As we know that

$$P = \frac{wv^2}{gR}$$

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

If θ is the inclination of road surface the inclination of resultant the vehicle is also θ

So, we have

$$\tan\theta = \frac{dc}{ac} = \frac{P}{w} = \frac{bv^2}{gR}$$

ON ROADS:

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

ON RAILWAYS:

$$b \tan\theta = \frac{Gv^2}{gR}$$

RADIUS:

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

$$R = \frac{v^2}{b \tan\theta g} \quad \text{(For roads)}$$

$$b \tan\theta = \frac{Gv^2}{gR}$$

$$R = \frac{Gv^2}{b \tan\theta} \quad \text{(For railways)}$$

SPEED OF VECHILE:-

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

$$v^2 = b \tan\theta \, gR$$

$$v = \sqrt{b \tan\theta \, gR}$$

(For roads)

$$b \tan\theta = \frac{G v^2}{gR}$$

$$v^2 = \frac{b \tan\theta \, gR}{G}$$

$$v = \sqrt{\frac{b \tan\theta \, gR}{G}}$$

(For railways)

Question No# 02

Answer :-

TRANGULATION :-

Trangulation is aprocess in surveying in which tracing and measurement of a sesies or a network of triangles is used for determining distances and relative position of points over an area

PRINCIPALE OF TRIANGULATION :-

In triangulation all the three angles of each triangle are

In the field along with one base line
→ The side of the first triangle whose length is predetermined is called base "line" and vertices of the individuals triangles are known as triangulation station.
→ To minimize accumulation of errors in lengths, Subsidiary bases at suitable intervals are provided.

b) TRILEFRATION:

The method of surveying in which the

the lengths of the side of a triangles are measured and from this information angles are computed.

PRINCIPLE OF TRILFRATION:

→ It is a method of control survey in which a network of triangles is used as in triangulation.

→ All the three sides of each triangle are measured in the field.

→ With distance measuring instruments.

→ Horizontal angles are measure in the feild.

→ Trileteration is adjusted after the computation of the angles and then coordinates of the angles and then coordinates of the stations are determined.

→ In trileteration, angles are computed indirectly from the lengths of the sides of triangle.

DIFFERENCE b/w TRIANGULATION AND TRILETRATION :-

1) In triangulation, All angles of the triangles are measured. while in trilatration all sides of triangles are measured.
2) In triangulation, base line is measured while in trilatration Azimuth of initial line is measured.
3) For triangulation, intervisibility between stations are essential while in trilatrations. It is possible to measure distance without intervisibility.
4) These are more interval checks in triangulation as compored to that of trilatration.

Question # 03

(Part a)

Ans:-

HYDROGRAPHIC SURVEY:-

Hydrographic Surveying or bathymetric surveying is the survey of Physical features present under water. It is science of measuring all factor beneth water that affed all the marine construction offshore drilling etc.

Hydrographing surveying

is mainly conducted under authority concern it is mainly carried by means of sensors sounding or electronic sensor system for shallow water.

⇒ WHY we do Hydrographic Surveying:

In oder to get following information we do Hydrographic surveying.

→ 1) Depth of bed can be determined.

2) Shore lines can be determined

3) locating mean sea level

4) Tride measurment.

5) locating sewes Fall by measasing direct cussed.
6) Rives and stream discharge measurements.
7) Massive structures like bridges dams harbors are planned.

Part (b)

SOUNDING:-

The measurment of depth below the water surface is called sounding. This corresponds to the ordinary spirit leveling in land

Surveying whose depth are measured below Horizontal line establish by level. The object of making sounding is thus to determine the configuration of the sub aqueous source.

PURPOSE OF SOUNDING:

Sounding is most important for any water body to improve its negligable properties, to know about silting and scouring etc.

In Hydrographics surveying sounding is the measurement of depth below the wates surface.

In short the main purpse and objective of sounding to measure and finding the depth below the wates surface.

EQUIPMENTS

1) Sounding boat
2) Sounding rods and poles
3) load lines.

4) Sounding machine

5) Fathometer

Question No #4

Part A:-

Ans:-

PHOTOGRAMMETERY:-

Aesial photogramme-tesy is process in which an aircraft with camera is used to take photograph from certain height in the air. A minimum 3 to 4 control points needed in ase photograph.

REASONS FOR USES OF AERIAL PHOTOGRAMMETERY:-

Following reasons of the arial photoghrammetry

→ It is used because it Provides computer senorated 2D & 3D modeh. These modeh are the dimention & physicd featuse of the area of land & in stuning accu-rasty

→ These moded can be relabed & zoomed. Along with surving many of the uses of

of Arial photogranetery in different field.

PART (B)

PROCEDURE OF AERIAL PHOTOGRAPHY:-

Main steps of Arial photography.

→ Establishing control points.
→ Flight plainning & photography.
→ Photointerpretation & stereoscopy.
→ Parallex and measurement of parallex.
→ Construction of map & Cartography.

ESTABLISHING CONTROL POINTS:-

Control points are those points established on ground with known relative positions. The photography captured is observed by Setting these control points as boundries. These should be minimum 3 to 4 points in a photograph.

FLIGHT PLANING AND PHOTOGRAPHY:-

Flight planing

is actually knowing the height to be maint. while taking photo, area to be covered in each photograph, Number of photograph, no of.

PHOTO, INTERPETATION AND STEREOSCOPY:~*

photo interpretation is done by stereoscope which contains magnifiers, we can observe the three dimensional model of area & easily. we can so for drawing of maps of photographed area.

For Accuracy, control station, elevation length of lines should be available.