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SEC, C.

FINAL PAPER Submission

of Survey 2.

SUBMITTED TO, "SIR

Abdul Fashan"

Question 1 PROBLEM.

Soli-.

As we know.

$$\alpha = 180^\circ - 130^\circ = 50^\circ$$

$$\beta = 180^\circ - 140^\circ = 40^\circ$$

$$\phi = \alpha + \beta = 90^\circ$$

$$I = 180^\circ - 90^\circ$$

$$\Rightarrow KT_1 = KN = R_s \tan\left(\frac{\alpha}{2}\right)$$

$$= (7744) \tan\left(\frac{50}{2}\right)$$

$$KT_1 = 3474.433$$

finding MN.

$$MN = MT_2 = R_L \tan\left(\frac{\beta}{2}\right)$$

$$= 7744 \tan\left(\frac{40}{2}\right)$$

$$MT_2 = MN = 2748.703$$

$$KM = MT_2 + KT_1$$

$$KM = 6223.627.$$

Now,

finding ΔBKM, By sine rule,

$$\frac{BK}{\sin\beta} = \frac{MK}{\sin(\alpha)}$$

$$BK = \frac{MK \sin\beta}{\sin(I)}$$

$$" = \frac{6223.627 \sin(40)^\circ}{\sin(90)^\circ}$$

$$BK = 4000.47.$$

Now,

$$BM = \frac{MK \sin\alpha}{\sin(I)}$$

$$Bm = \frac{6223.627 \sin(50)}{\sin 90^\circ}$$

$$Bm = 4767.574$$

$$T_L = KT_1 + BK$$

$$= 3474.924 + 4000.47$$

$$T_L = 7475.394$$

$$T_S = MT_2 + Bm$$

$$= 2748.703 + 476.574$$

$$T_S = 7516.277$$

$$L = \frac{\pi R_L \alpha}{180^\circ} = \frac{\pi\ 7744(50^\circ)}{180^\circ}$$

$$L_S = \frac{\pi R_S \beta}{180^\circ} = \frac{\pi\ 7744(40^\circ)}{180^\circ}$$

$L_2 = 6590.364m$

$L_5 = 5202.477m$

=> Ch. of intersection point - T_2.

7744 - 7475.394.

=> Ch. of $T_1 = -123.394$.

Ch of $T_1 + L_2$

$= -123.394 + 6590.363$

$= 6466.969m$

Change of compound curvature.

(N) Plus L_5

$6466.969 + 5202.477$

Ch. of $T_2 = 11669.446m$

Ans.

Question 2:- ANSWER:-

TRANSITION CURVE:-

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 B/w tangent & a Circular curve in orders to have a smooth transition from tangent to the curve & from curve to the tangent.

⇒ It is also Ensured B/w two Branches of compound curve.

* SUPER ELEVATION :-

let

W = weight of the vehicle P = Cf

v = speed of the vehicle, m/s.

g = Acceleration due to gravity, m/s^2.

R = Radius of the curve, m b = super elevation m.

b = width of the road, m.

for equilibrium the Resultant R of the P & W must be equal & opposite to the reaction perpendiculars to road or rail surface.

$$P = \frac{mv^2}{R} = \frac{mv^2}{gR} \qquad \because W = mg.$$

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

$\tan\alpha = h/b = dG/gc \; w \; \underline{P}$.

$\tan\alpha = h/b = w \; P/gR = v^2$.

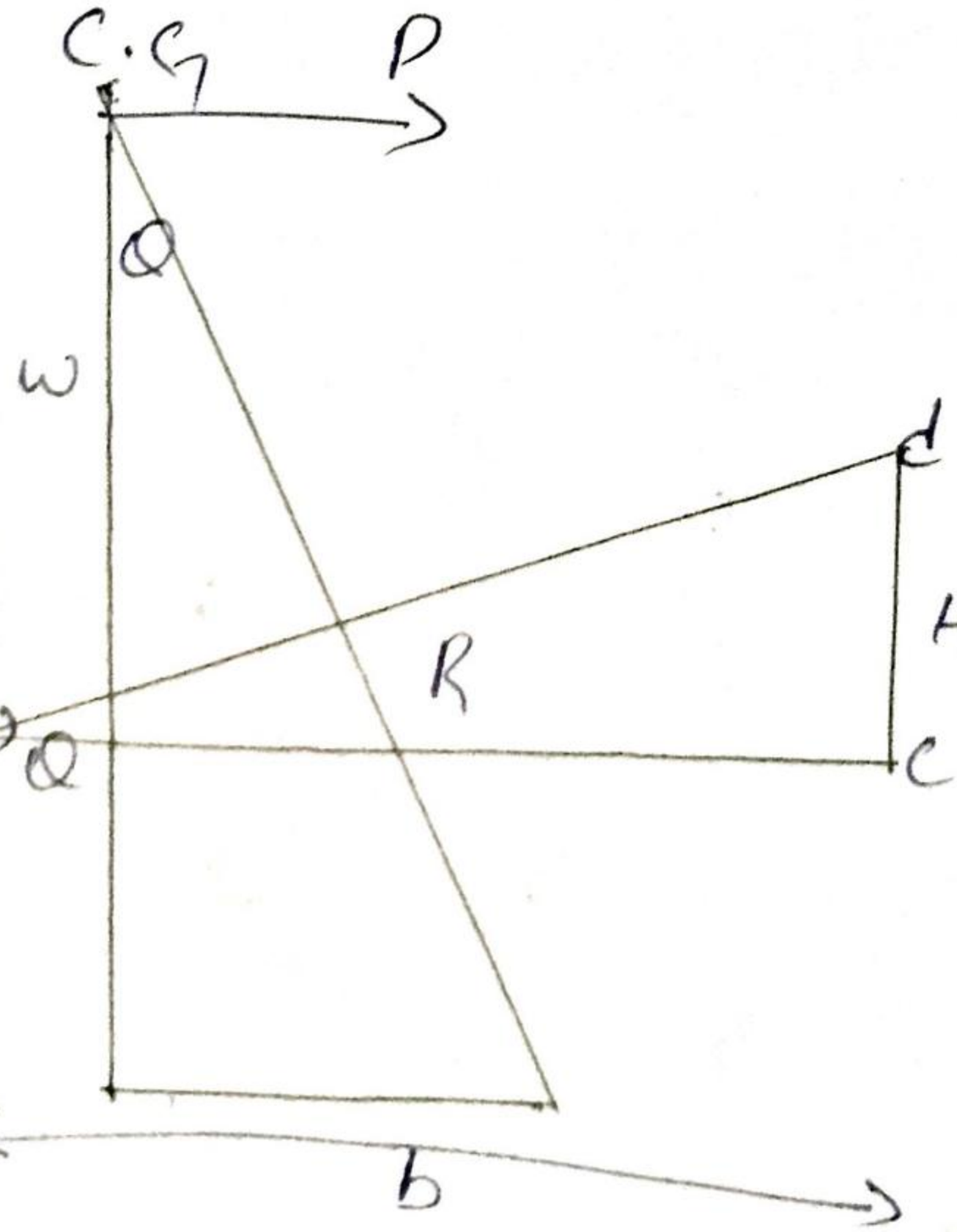
$h = b \tan\alpha$.

$h = b \; v^2/gR$ ---- on highway.

$h = b \; Gv^2/gR$ ---- on railway.

where G is distance B/w the centes of the rail.

"DIAGRAM"



Question # 3.

ANSWER:-

TRIANGULATION	TRILATERATION
=> All angles are measured in triangulation.	=> All sides are measured in trilateration.
=> Distance of baseline is measured	=> Azimuth of the initial line is measured.
=> Some check baselines are also measured to control scale error.	=> Some check angles are measured to control azimuth error.
=> Intervisibility B/w stations is essential.	=> For small areas it is possible to measure distances without intervisibility

=> These are more internal checks in comparison with trilateration on the same geometric figure.

=> These are less internal checks in comparison with triangulation on the same geometric figure.

* PRINCIPLE of TRIANGULATION :-

In surveying, triangulation is the process of determining the location of a point by measuring only angles to it from known points at either end of a fixed baseline, rather than measuring distances to the point directly as in trilateration.

=> Sine Rule

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

OR $$\frac{\sin(A)}{\alpha} = \frac{\sin(B)}{\beta} = \frac{\sin(C)}{\gamma}$$ (for finding angles)

* PRINCIPLE of TRILLATERAION :-

=> Trilateration is a highly accurate a precise method of establishing & expanding horizontal control.

=> Method of control survey in which a network of triangles is used as triangulation system.

=> Horizontal angles are not measured in the field.

=> vertical angles are also measured whose elevations have not been established.

* Cosine Rule :-

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

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

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

$$A = \cos^{-1}\left(\frac{b^2 + c^2 - a^2}{2bc}\right)$$

Question 14. Past(A).

HYDROGRAPHIC SURVEYING -

Hydrographic Surveying or bathymetric surveying is the survey of Physical features present Underwater. It is the science of measuring all factors beneath water that effect all the marine activities like dredging, marine constructions, offshore drilling etc.

=> The usual fundamental Principls of surveying & levelling are adopted for acquiring data for determination of :-

① water volume.
② Rate of flow
③ To determine the shape of the area.

* Purpose :-

=> To determine the quantities of subaqueous excavation.

=> Measure areas subjected to scouring or silting in harbours or docks.

=> locate rocks & other objects such as buoys, lights, etc, to aid safe navigation.

=> To prepare navigation charts exhibiting the depths available for navigation.

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

=> To develop water resources for power, irrigation & recreation.

Question 4 Past (B)

ANSWER.

SOUNDING:-

The process of determing depths below the wates surface is called sounding.

=> Sounding is analogues to levelling on land.

=> The reduced level of any point on the bottom of a wates body is obtained by subtracting the sounding from the mean sea level.

* PURPOSE of SOUNDING:-

=> Preparation of accusate charts for navigation.

=> Determination of the quantities of the material to be filled.

=> Obtaing information for design of breakwaters, sea walls etc.

* Equipments :-

① Sounding Boat.

② Sounding Pole or rod.

③ lead line.

④ Weddell's Sounding machine.

⑤ Echo Sounding machine / fathometer.

Question 5 Past (A)

ANSWER.

Ans- AERIAL PHOTOGRAMMETRY -

Aerial photogrammetry consists of using imagines gathered in the air by UAV's to create computer generated 2D & 3D models. These models are topographical in nature meaning they represent the dimensions & physical features of the area of land in stunning accuracy. These models can be rotated & zoomed because they are created entirely from images of the real locations as captured by a UAV they will show every last photographic detail that exists in those photos.

*USE of AERIAL PHOTOGRAMMETRY:-

A trained interpreter can thus utilise aerial photographs to analyse the land use changes. eye view of large areas, enabling us to see features of the earth surface in their spatial content. It can, therefore be used a historical record.

PART (B).

*PROCEDURE of AERIAL PHTOGRAPHY:-

=> Reconnaissance.

=> Establishing ground control

=> Flight planning.

=> Photography.

=> Computation.

=> Plotting.

* GROUND CONTROL :-

=> obtain a set of points of known position.

=> Based on the other points are located & plotted.

=> Number depends on.

- Extend of area
- Scale of map
- flight plan
- Process of preparing the map.
- Minimum of three control points
- Triangulation.
- Precise surveying.

=> Basically in Aerial survey we collects geometrics or other imagery by using airplanes, helicopters, UAV's

ballon's or othes asial methods. Typical types of data collected include aerial photography. Cidar, remote sensing.

Today, aerial survey is sometimes recognized as a synonym for aero-photogrammetry where the camera is placed in the ais. Measurments on asial imges are provided by photo-grammetric technologies & methods.