2. Surveying

1 Define Surveying.

Surveying is very important part of Civil Engneering.

Surveying is use to determining the relative positions of various points on the surface of the earth.

Surveying is measure to earth by the horizontal and vertical distances and Angle.

=> Define Levelling:

Levelling is very important branch of Surveying.

Levelling is deals with the measurments of relative points to the heights of the surface earth.

Levelling is measure to earth surface by only vertical plane.

=> What are the objects of Surveying?

The object of surveying is use to prepare map or plan to show the relative positions of the points on the surface of earth.

In Surveying, map or plan drawn by using sam scale.

Surveying is also includes buildings, railway, roads, dams etc construction map or plan

=> Application of Surveying:

Surveying is use to prepare military map, geological map etc.

Surveying is use to prepare tropographical map and which represent hill, riveres etc.

It is also use to prepare engneering map which show roades, railways, dams, cannels etc.

ser
Surveying is also use to prepare map to the positan of points in construction work like building, railway, roads etc.
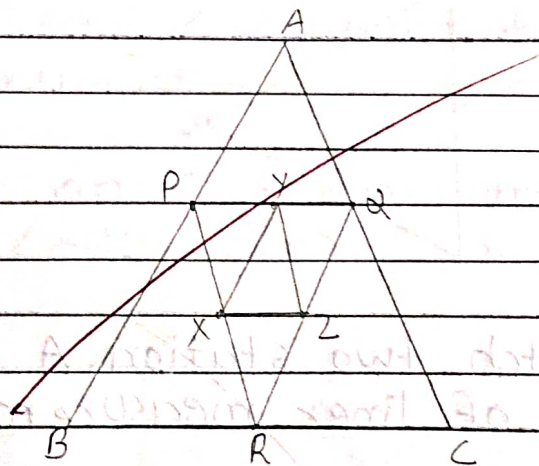
2 Explain the fundamental principles of Surveying with neat sketch.

There are two basic fundamental principles of Surveying.

1 Always work from the whole to the part.

=) In this basic principle, the whole survey area is covered by main station and main survey lines.

In this principle, the area is divied into number of the division by well conditioned triangle system.

In this sketch surveying area divied into triangle system.

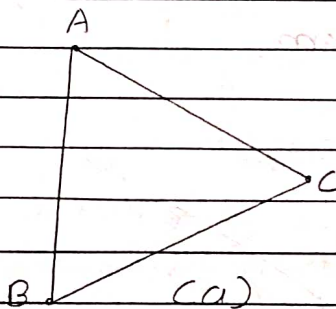In this sketch $\triangle ABC$ is main station and main survey lines.

In △ABC, There are two triangle use for the area dividation.

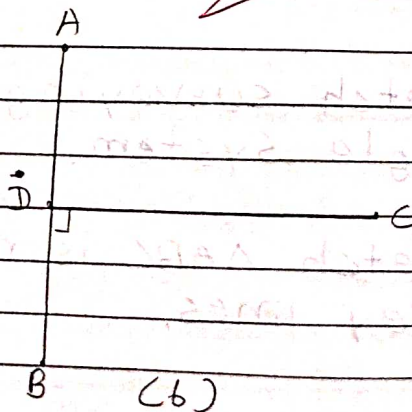So, This is called the area dividation to use of triangle system.

(b)

2 To Locate a new station by at least two measurements from fixed reference points.

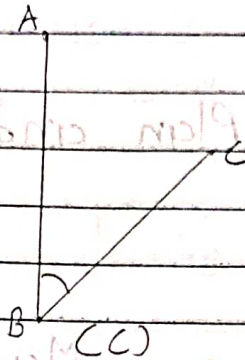=) In this principle two points or station are located by liner and Anguler measurement.

(c)

(a)

a In this sketch two station A and B connet use of liner measurements by c station.

(b)
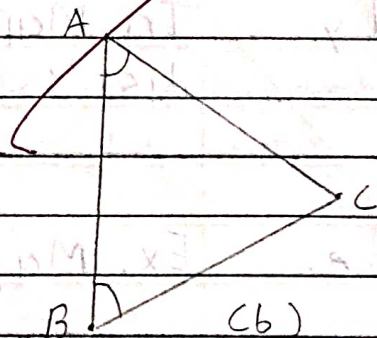

(b)

(6) In this sketch two station A and B are connect to the linear measurement and DC line is perpendicular to the AB line.

(c)

(c) In this sketch two station A and B are connect to the linear measurement and B and C connect to the Angular measurement.

and B an C station are connect and make ∠ABC.

(b)

(b) In this sketch two station A and B are connect to the linear measur- ement.

Station A and C are connect with Angle measurement and make ∠CAB

Station B and C are also connect with Angle measurement and make ∠ABC

3   Differentiate : 1) Plan and Map.

	Plan	Map
1	Plan is drawn on a large scale.	Map is drawn on a small t scale.
2	Plan is drawn for small area.	Map is drawn for large area.
3	In Plan scale : 1 cm = 1om or < 1om	In Map scale : 1 cm = 1oom or > 1oom
4	In Plan generally horizontal dist's shown.	In Map vertical dist's is also shown.
5	Ex. Plan of house.	Ex. Map of city.

=> Differentiate : 2) Plane Surveying and Geodetic Surveying.

Plane Surveying	Geodetic Surveying.
1 The earth surface is considered as a plane Surveying.	The earth curved surface is considered as geodetic surveying.
2 The curvature of the earth is ingored.	The curvature of the earth is account.
3 This suitable for Small area.	This suitable for large area.
4 Survey accuracy is low.	Survey accuracy is high.
5 Economic and easy survey method.	Special Instrument needed.
6 two points are connect as a strcight line	two points are connect as a circh.

4   Define: Map, Plan, Scale, R.F.

=> Map:

    If the scale of the graphical projection on
    a horizonatal plane is small, then this is
    called Map.

    In Map horizontal plan distances or
    angle are shown.

=> Plan:

    If the scale of the graphical projection
    on a horizonatal plane is large, then
    this is called plan.

    Plan is drawn on a relatively large
    scale.

=> Scale:

    Scale is the basic requirement for the
    preparation of plane or Map.

    Scale is used to represent large distance
    on paper.

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=> RF :

RF is a ratio of distance object on
drawing and actual distance of object,

$$RF = \dfrac{\text{distance of object on drawing}}{\text{Actual distance of object.}}$$

6. A 10 km long road is indicated in a map
by a length of 10 cm straight line.
Calculate the scale and R.F. of a map.

distance of object on drawing is 10 cm.
Actual distance of object is 10 km.

So, Scale is 1 cm = 1 km.

$$R.F. = \dfrac{1\ cm}{1\ km} = \dfrac{1}{1000 \times 100}$$

$$\therefore R.F = 1 : 100000$$

7. A plan represents an area of 78000 m³
and measures 3 × 5 cm. Find the scale
of the map and R.F.

Actual length 3 × 5 cm

$$1 \text{ cm}^2 = \frac{72000}{3 \times 5 \text{ cm}^2} \text{ m}^2$$

$$1 \text{ cm}^2 = 4800 \text{ m}^2$$

$$1 \text{ cm} = 69.28 \text{ m}$$

$$\Rightarrow R.F = \frac{1}{69.28 \times 100}$$

$$= \frac{1}{6928}$$

$$R.F = 1 : 6928$$

5 Classification of Surveying.

Surveying can be classified into different types.

1 Classification based on Instruments.

There are nine types of Surveying.

(1) Chain Survey
(2) Compass Survey
(3) Chain and Compass Survey
(4) Plane Table Survey

(5) Theodolite Survey
(6) Tacheometry Survey
(7) Levelling Survey
(8) Photogrammetric Survey
(9) EDM ₹ Survey.

2.   Classification based on Methods.

(1) There are two types of Surveying.

(1) Triangulation
(2) Traversing.

3.   Classification based on Purposes.

There are four types of Surveying.

(1) Geological Survey.
(2) Mine Survey
(3) Archaeological Survey
(4) Military Survey.

4.   Classification based on Nature of Field.

There are four types of Surveying.

(1) Land Survey
(2) Hydrographic Survey
(3) Astronomic Survey
(4) Aerial Survey.