भूगोल प्रयोगात्मक (Geography Practical)

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BA 2nd SEMESTER 2021-22

PRACTICAL GEOGRAPHY FILE

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MAP PROJECTION

A map projection is a systematic representation of the parallels of latitudes and Meridians of longitude of the spherical surface of the earth on a plain surface. The network of the parallels and the meridians so formed is called a "GRATICULE".

According to Monkhouse a map projection is "representation of the Earth's parallels and meridians as a net or graticule on a plain surface."

Classification of Map projection on the basis of Developable Surface:-

1. Cylindrical Map projection
2. Conical Map projection
3. Zenithal Map projection.

1. Cylindrical Map projection

→ In this projection the parallel's and the meridians of a globe are transfered to a cylindrical which is a developable surface.

▲ We take a cylinder, the diameter of which is equal to the diameter of globe and place the globe inside the cylinder

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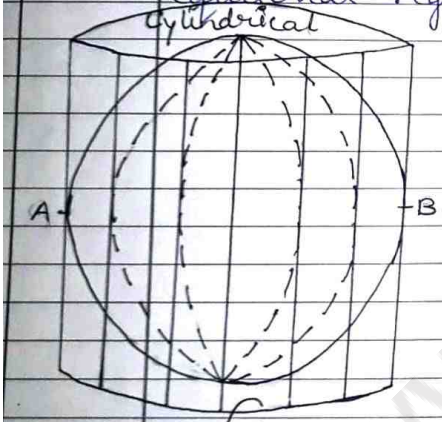
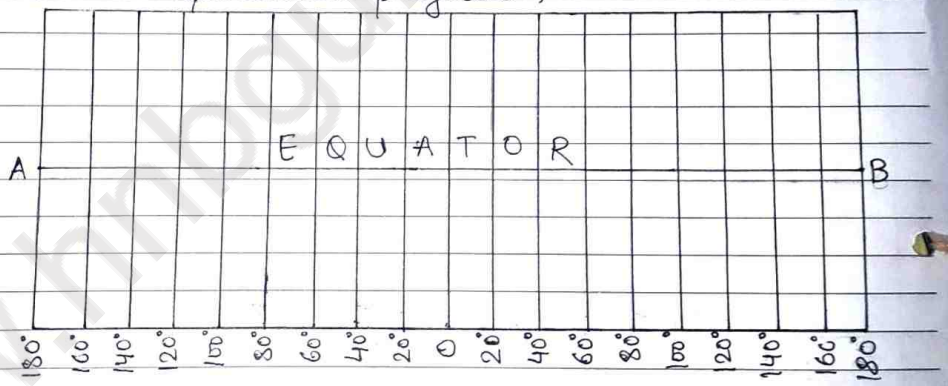
in such a way that it's equator touch the cylinder.

- We then bring the //s and meridians of the globe by using certain methods.
- Each parallel is equal to the length of equator thus the parallels are longer than the corresponding parallels on the globe.
- The meridians are straight lines, they intersect the equator at right angle and they are equispaced in all latitudes.
- The lengths of equators on the cylinder is equal the length of equator on the globe.
- Therefore this projections are quite suitable for showing equitorial region.



Cylindrical projection



CYLINDRICAL MAP PROJECTION.

1- Mercator's orthomorphic projection.
2- Simple cylindrical map projection
3- Cylindrical Equal area map projection.

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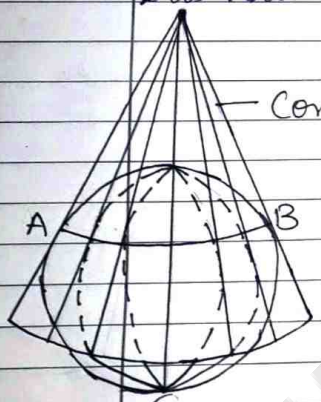
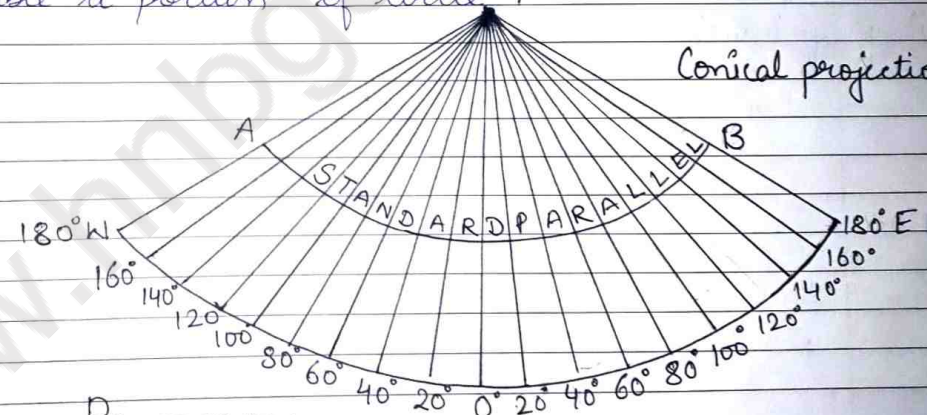
CONICAL MAP PROJECTION

The parallels and meridians of the globe are transferred to a cone placed on the globe in such a way that it's vertex is above one of the poles and it touch the globe along a parallel.

The parallels and meridians of the globe in such a way that it's vertex is above one of the poles.
The parallel along which the cone touch the globe is called a standard parallel.
If we cut cone from its apex downward and unroll on flatsheet this will resemble a portion of circle.



Conical projection



CONICAL MAP PROJECTION-

1- Simple conical projection with one standard parallel
2- Simple conical projection with two standard parallel
3- Bonne's Projection.

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Simple Conical Projection With One parallel Standard

A conical projection is one, which is drawn by projecting the image of the graticule of a globe on a developable cone, which touches the globe along a parallel of latitude called the standard parallel.

PROPERTIES -

i - All the parallels are arcs of concentric circle and are equally spaced.

ii - All meridians are straight lines merging at the pole. The meridians intersect the parallels at right angles.

iii - An arc of a circle represent the pole.

LIMITATION -

i - It is not suitable for a world map due to extreme distortions in the hemisphere opposite the one in which the standard parallel is selected.

USES -

i - This projection is commonly used for showing areas of mid-latitude with limited latitudinal and larger longitudinal extent.

ii - Direction along standard parallel is used to show railways, roads etc.

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MERCATORS PROJECTION

This projection named after it's inventor Geradus Mercator. A Dutch cartographer in 1569. Mercator devised a mathematical formula by virtue of which he placed the parallel increasingly further apart towards the pole thereby increasing the length of meridians was in same proportions in which the lengths of parallels increased. By doing so he got a true orthomorphic projection. The projection is therefore also called the cylindrical orthomorphic projection.

PROPERTIES:-

i- Parallels and meridians are straight line.
ii- The meridians intersect the parallels at 90°.
iii- The distance between the parallels go on increasing towards poles but the distance between meridians remains the same.

LIMITATION-

i- There being a great exaggeration of scale along the parallels and the meridians in high latitudes, the size of the countries in this projection are very large in the polar areas for this reason the polar can't be shown satisfactorily on this projection.

USES - i- This is commonly used for navigational purposes both on the sea and in the air.

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ii - Maps of Tropical countries are shown on this projection when they are to be used for general purposes. The reason is that exaggeration in the size of an area that is small within the tropics and the shapes of the countries are preserved without much distortion.

AIM - Construct a graticule for mercator's projection on the scale of 1:320,000,000, spacing parallels and meridians at 20° interval.

CALCULATION - Radius of the Earth = 640,000,000 cm.

∴ Radius of the globe on the scale of $\frac{1}{320000000} = \frac{1}{320000000} \times \frac{2}{640000000}$

= 2 cm.

The length of the Equator = $2\pi r$, $2 \times \frac{22}{7} \times 2 = 4 \times 3.14$

$= 12.56$

The spacing between the meridians = $\frac{2\pi r \times 20}{360}$

$= \frac{2 \times 22 \times 2 \times 20}{7 \times 360} = 3.14 \times 0.22$

$= 0.69$ cm $= 0.7$ cm [approx]

Latitude	Distance of parallel from the equator [in cm]
20°	$0.356 \times 0.692 = 0.712$ cm
40°	$0.763 \times 2 = 1.526$ cm
60°	$1.317 \times 2 = 2.634$ cm
80°	$2.436 \times 2 = 4.872$ cm

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CONSTRUCTION METHOD-

i- Draw a line AB 12.56 cm long to represent the equator.

ii- The equator is a circle on the globe and is subtended by 360°. Since the meridians are to be drawn at an interval of 20°, divided AB into $\frac{360}{20}$ = 18 equal parts.

iii - Draw lines perpendicular to AB, to drawn the parallels, distance of parallels taken from the table at the given interval.

iv - To drawn the meridians, erect perpendicular on the points of divisions which is 0.7cm and produce them so that they need 80°N and 80°S parallels.

v- Marked the equator and central meridian with 0° and other parallel and meridians as shown in graphical construction.

vi - ABCD is the required graticule.

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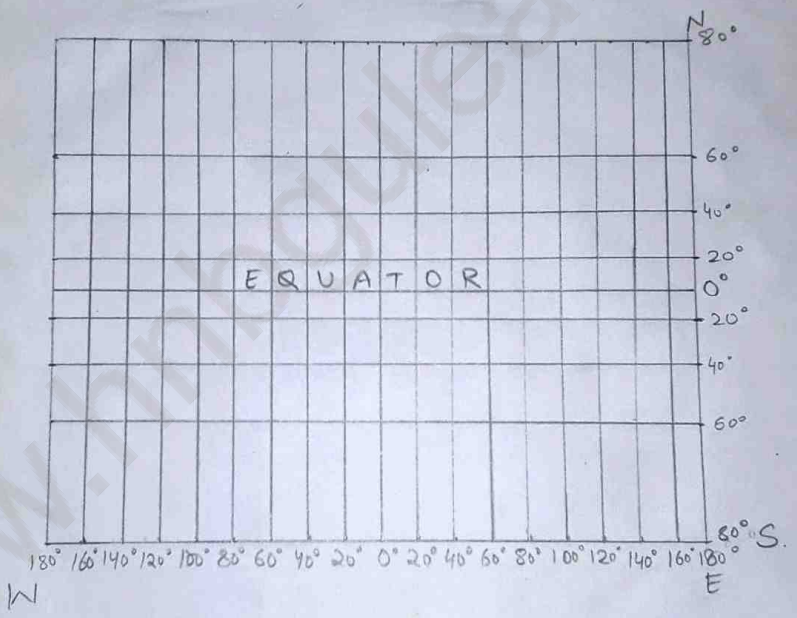
MERCATOR'S PROJECTION
RF 1:320,000,000

GRAPHICAL CONSTRUCTION



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AIM Construct a conical projection with one standard parallel for an area bounded by 10°N to 70°N latitude and 10°E to 130°E longitudes when the scale is 1:250,000,000 and latitudinal and longitudinal intervals is 10°.

CALCULATION- Radius of reduced earth = $\frac{6400000000 \times 1}{250000000}$ = 2.56 cm

Standard parallel is 40°N (10, 20, 30, 40, 50, 60, 70)

Central meridian is 70°E (10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130)

CONSTRUCTION- i) Draw a circle or a quadrant of 2.56 cm radius marked with angles COE as 10° interval and BOE and AOD as 40° standard parallel.

ii) A tangent is extended from B to P and similarly from A to P, so that AP and BP are the two sides of the cone touching the globe and forming standard Parallel at 40°N.

iii) The arc distance CE represents the intervals between parallels. A semi-circle is drawn by taking this arc distance.

iv) X-Y is the perpendicular drawn from OP to OB.

v) A separate line N-S is taken on which BP distance is drawn representing standard parallel. The line NS becomes the centra

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meridian.

vi) Other parallels are drawn by taking arc distance CE on the central meridian

vii) The distance XY is marked on the standard parallel at 40° for drawing other meridians.

viii) Straight lines are drawn by joining them with the pole.

Simple Conical Projection With Two Standard Parallel

It is a modified case of the simple conical projection and is a non-prospective projection. Here two standard parallel are considered, Hence, it can show wider area extending N-S. The two standard parallel correspond to two respective parallels of the globe and the independent cones.

PROPERTIES -

i- The parallels are drawn or arc of concentric circles and are equi-spaced

The meridians are straight lines radiating from the common centre

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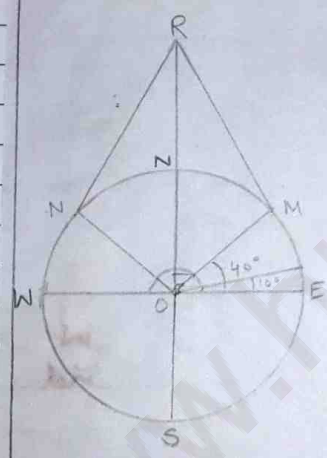
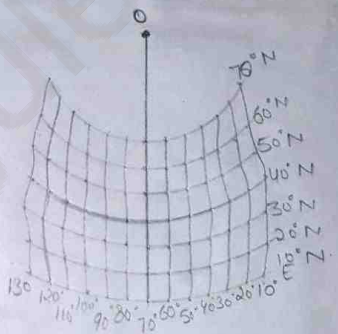
Simple Conical Projection With 1 Standard Parallel





1 Standard Conical projection

RF 1:250,000,000

as radii of concentric circle curves.

iii - The scale is true along the two ~~standard~~ parallels are equal, as well as the central meridians and other meridian.

iv - The interval between meridians on any given parallels are equal but they are progressively reduced as one goes towards the pole.

USES -

I - It is used for mid-latitudes zone that have an E-W orientation.

II - It can be used for showing trans-siberian railways. Canada, USSR and also to some extent China.

AIM - Construct a conical projection with ~~two~~ standard parallel for an area bounded by 30°N to 80°N latitude and 40°W to 40°E longitudes when the scale is 1:50000000 and latitudinal and longitudinal intervals is 10°.

CALCULATION - Radius of reduced earth = $\frac{640000000}{50000000}$ = 12.8 cm

Standard parallel → 40° - 70°N [30, 40, 50, 60, 70, 80]

Central meridian → 0° [40, 30, 20, 10, 0, 10, 20, 30, 40]

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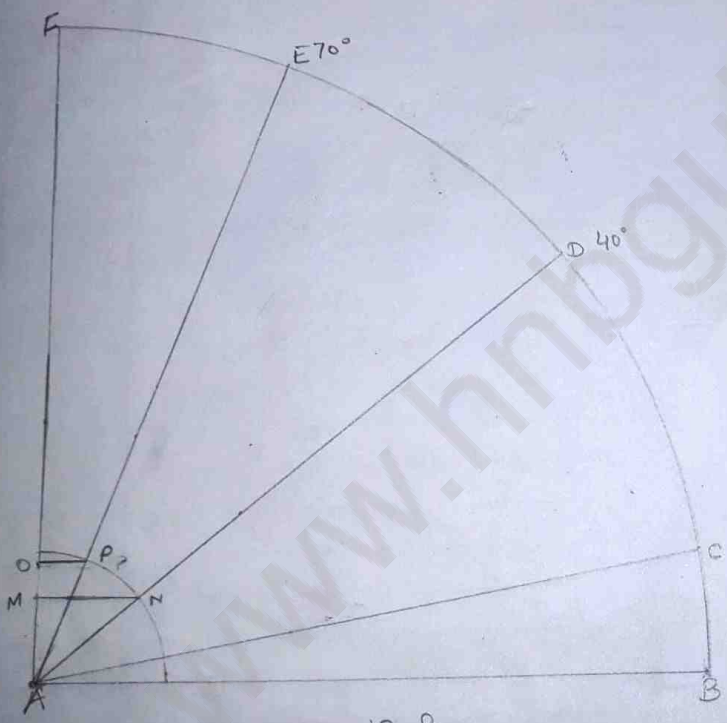
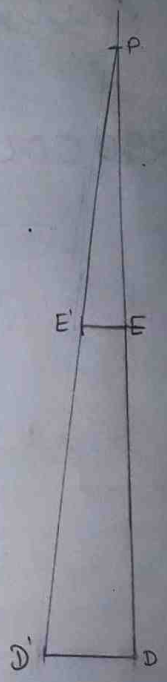
CONSTRUCTION - PROJECTION WITH TWO STANDARD PARALLEL

R.F 1:50,000,000.

Step-1



Step-2.



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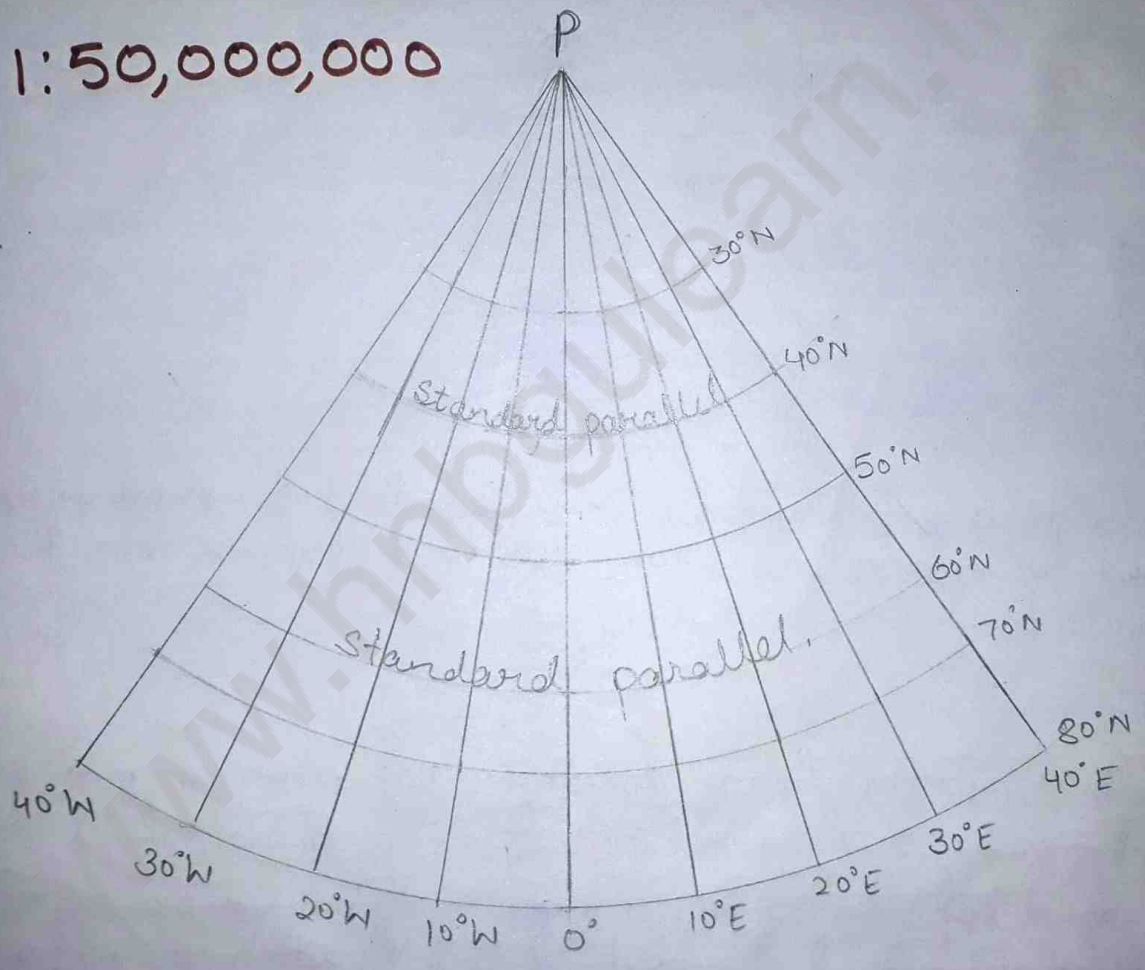
CONICAL PROJECTION WITH TWO STANDARD PARALLEL

RF 1:50,000,000

Step - 3



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BONNE'S PROJECTION

It is modified conical projection with one standard parallel. It was invented by Rigobert Bonne, A French Cartographer.

PROPERTIES -

1- The parallels are concentric circle's arc. The pole is represented as a point on this projection.

2- All the parallels are correctly divided for spacing the meridians. The scale along the parallels is thus correct.

3- The scale along the meridians increases away from the central meridian.

LIMITATIONS -

1- The shapes away from the central meridian are distorted. The distortion increases away from the central meridian.

2- The shapes in the margin of projection showing the large area such as Asia are much distorted.

USES -

1- It is an equal area projection and since shapes are maintain satisfact for small areas, this projection is used for showing maps of europear countries. Eg- Spain, Germany, France etc.

2- This projection is used by small countries of middle latitudes fo making Topographical Sheets.

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AIM - Construct a network of Bonne's projection on a scale of 1:200,000,000 spacing the parallel and the meridians at an interval of 15° for an area which extends from the equator to the North pole and from 75°W to 75°E.

CALCULATION - Radius of the Earth = 250,000,000 inches

∴ Radius of the globe on the scale of 1:20,000,000.

$$= \frac{1}{200,000,000} \times 250,000,000 = 1.25 \text{ inches}$$

The length of the arc = 15°

∴ length of the arc subtended of 15° = $\frac{2\pi r \times \text{interval}}{360}$

$$= 2 \times \frac{22}{7} \times \frac{1.25 \times 15}{360} \text{ inch} = 0.328 \text{ inches}.$$

CONSTRUCTION - i) Draw a circle with radius equal to radius equal to radius of the globe i.e. 1.25 inches.

ii) Let 'NS' its polar diameter and 'WE' its equitorial diameter intersect each other at right angle at O at the centre of the circle.

iii) 45°N parallel of latitude was choose as the standard ||.

iv) Let radius 'OP' make an angle of 45° with 'OE' also drawn radii Or, Os, Ot and Ou making angles of 15°, 30°, 60°, 75 respectively.

v) With O as centre and radius equal to 0.328" draw an arc a, b, c, d, e, f, g. This arc cuts the radii Or, Os, Op, Ot and Ou at b, c, d, e and f. From those points drop perpendiculars bl, ck, dj, ei and fh, on ON.

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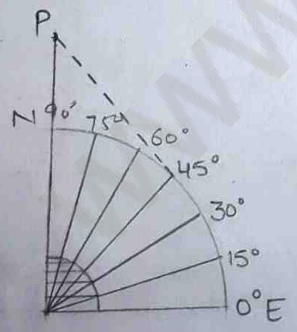
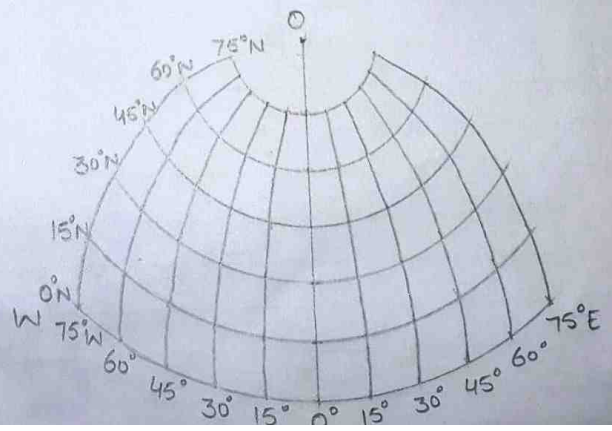
vi) Drawn OP perpendicular to PO. Produced ON to meet PQ at O. Drawn a line LM. With L as centre and OP as radius drawn an arc interacting LM at N'. This arc will describe the standard parallel i.e. 45°N parallel.

vii) From the point 'N', mark off distance N'W, WX and x 90° towards L and distances N'y, yz and zM towards M, each distance being equal to the arc subtended by 15°, i.e., 0.328 inch. With 'L' as centre, drawn arcs passing through the points x, w, y, z and m. These will represent the parallels and arc passing through M the equator.

Marked off distances b, d, c, k, dj, ei and fh along 15°, 30°, 45°, 60° & 75° parallels respectively. Joined the points of division on the parallels by smooth curves. The curves represent meridians

BONNE'S PROJECTION
RF 1:20,000,000





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POLAR-ZENITHAL EQUAL AREA PROJECTION

The popularity of Polar-Zenithal sterographic projection is because of its suitability for maps of hemisphere, as well as its property of orthomorphism.
The zenithal map projection is constructed by projecting the parallels and meridians of the globe on the plane placed tangentally to it at one of the pole. The source of light is diametrically opposite to the tangent plain.

PROPERTIES-

1- The parallels are concentric circle. The pole is a point forming the centre of projection.
2- The meridians are straight lines radiating from the centre and are equispaced along the parallel.
3- The meridians intersect the parallel at right angles.
4- It is an orthomorphic projection and the shape of small areas are preserved on it.

LIMITATIONS -

1- Areas are enlarged away from the centre of projection. It is only a small area in the central part of projection that is represented in a satisfactory way.

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USES -

1- Suitable for showing the hemisphere.

2- The entire Northern or Southern hemisphere can be shown in this projection and it is generally used to show the world in hemisphere. As being orthomorphic it is good visual look of the region.

3- This projection is used for preparing sea navigation routes of Arctic region.

AIM - Draw a network of polar zenithal stereographic projection for Northern hemisphere when the RF is 1:250,000,000 [inches] and interval is 15°.

CALCULATION - Radius of the earth = 250,000,000 inches

Radius of globe on the scale of 1: 250,000,000 =

$$\frac{1 \times 250,000,000}{250,000,000} = 1 \text{ inches.}$$

CONSTRUCTION: i) Draw a circle with a radius of 1inch representing globe.

ii- Let N-S be its polar diameter and W-E equitorial diameter intersecting each other at right angle at the centre of the circle.

iii- Let 'NA' represent a plane and it is placed a pole i.e. at 'N', and it is perpendicular to the diameter 'NS'.

iv- Now Mark the angles of 0°, 15°, 30°, 45°, 60°, 75° for showing the parallels of latitudes.

v- Join S with different latitudinal angle and produce them

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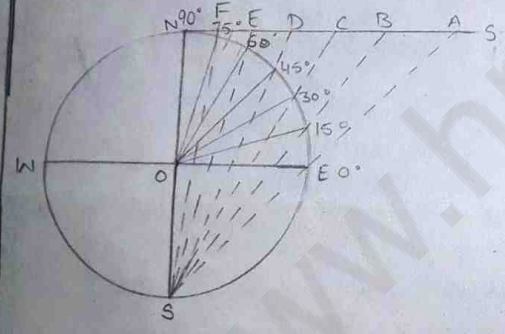
to meet the tangent plate at B', C', D', E', F' and thus the radius for drawing the parallel of latitudes as NB', NC', ND' NE' and NF' respectively.

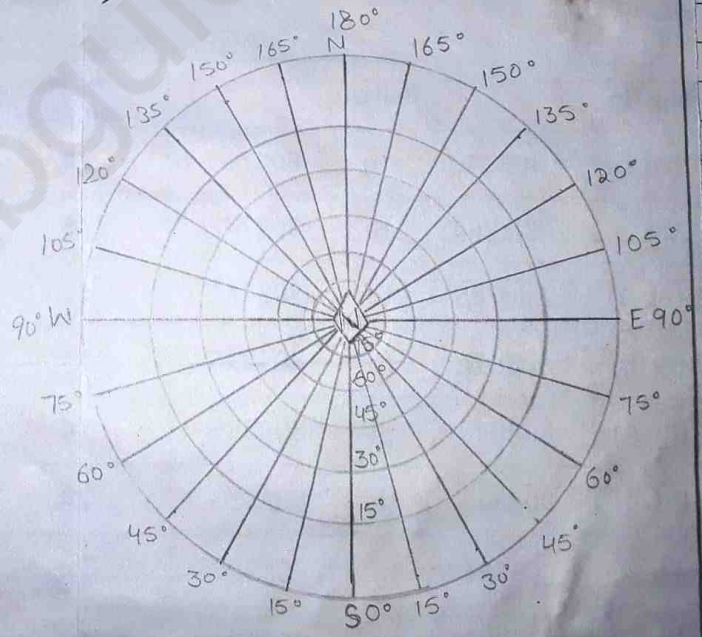
vi- Draw concentric circle with a 'O' as a centre.

vii- Draw straight line radiating from 'O' at angle of 15° for showing the meridian of longitude. Thus this is the projection of Northern hemisphere.

POLAR ZENITHAL STEREOGRAPHIC PROJECTION

RF 1: 250,000,000





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Weather Instruments

Weather denotes the atmospheric conditions of weather elements at a particular place and time. Weather include temperature, pressure, wind, humidity and cloudiness.
Daily weather map are prepared for that day by the Meterological Department from the data observed at various weather stations across the world.

Surface Observatories - A typical surface observatory has instruments for measuring and recording weather elements like temperature air pressure, humidity, clouds, wind and Rainfall.

Typical instruments includes - 1- Maximum and Minimum Thermometer
2- Anemometer and wind vane 3- Dry and wet bulb Thermometer
4- Rain guage 5- Barometer

TEMPERATURE - It is digree of hotness and coldness of an object as measured with the thermometer. Heat being basic to life on the Earth, Knowledge of temperature of different places is obviously useful. The two most common scale used in thermometer are centigrade and Fahrenheit. On the centigrade scale, the temp. of melting ice is marked 0°C and that of boiling water as 100°C and interval b/w the 2 is divided into 100 equal part. On the Fahrenhiet thermometer, the freezing and boiling points of water are graduated as 32°F and 212°F respectively

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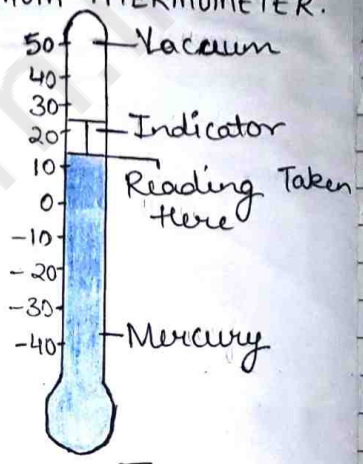
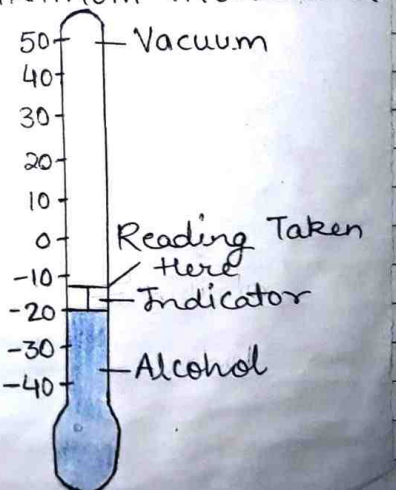
MAXIMUM AND MINIMUM THERMOMETER

The Maximum and minimum thermometer are used to measure the air temperature the dry bulb and the wet bulb are used to measure humidity in the air.
The Maximum thermometer is designed to record the highest temperature during a day. As the temperature increases during a day, the mercury moves up into the tube, however, as the mercury cools, it cannot move downwards because of a constriction in the tube, however, as the mercury cools it can't ~~so~~. It must be reset again to bring it down. The minimum thermometer records the lowest reading in a day In this thermometer, alcohol is used in place of mercury. When the temperature decrease the metal Pin in the tube goes down and strikes at the minimum temperature.

MAXIMUM THERMOMETER.



MINIMUM THEROMETER



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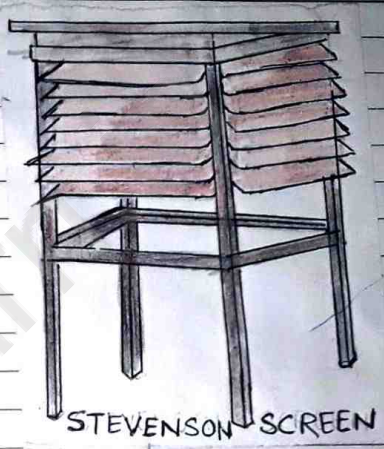
STEVENSON'S SCREEN

It is used for measuring temperature of air. Thermometer are kept under sheet and away from building. Specially designed wooden box supported by four wooden legs is used for housing the thermometer. This box is called Stevenson's Screen. The door of stevenson screen is always towards the south in the northern hemisphere and towards the south in the southern hemisphere because direct sunrays also effect mercury.



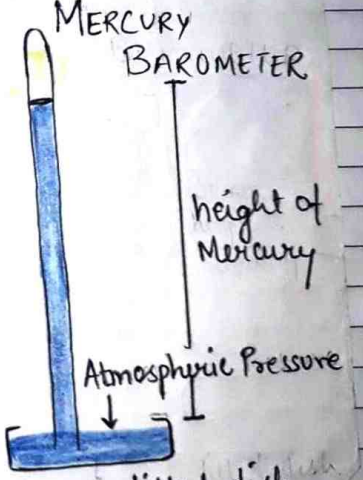
STEVENSON SCREEN

BAROMETER

Air has weight therefore the atmosphere exerts pressure this pressure is measure with Barometer. There are 4 types of Barometer.

1- ANEROID BAROMETER - It is commonly used by seaman, Airman and mountaineers for knowing the atmospheric pressure and related weather and height above sea.

2- BAROGRAPH BAROMETER - It is a combination of an android barometer and a rotating drum. A graph paper is wrapped round the



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drum. A graph paper is wrapped round the drum and the drum is allowed to complete 1 rotation in a day or a week. A curve indicating the changes in the pressure is marked on the graph paper.

3. FORTINIS BAROMETER - It is a mercurial barometer and is fitted in the laboratories and meterological observations for recording Annual Pressure. It represent A.P accurately.
4. KEW PATTERN BAROMETER - Fortin's Barometer is no longer used in the meterological observatories. Now Kew pattern Barometer is used. It's construction is almost similar to that of Fortin's Barometer. This Barometer is easy to operate and it gives the pressure reading quickly.

Unit of measuring atmospheric pressure is Millibar [mb]

WIND VANE

It is a device used to measure the direction of the wind. Wind vane is a lightweight revolving plate with an arrowhead on one end and two metal plates attached to the others end at the same angle. This revolving plate is mounted on a rod in such a manner that it is free to rotate on a horizontal plate. It responds even to a slight blow of wind. The arrow always points towards the direction from which the wind blows.

WIND VANE

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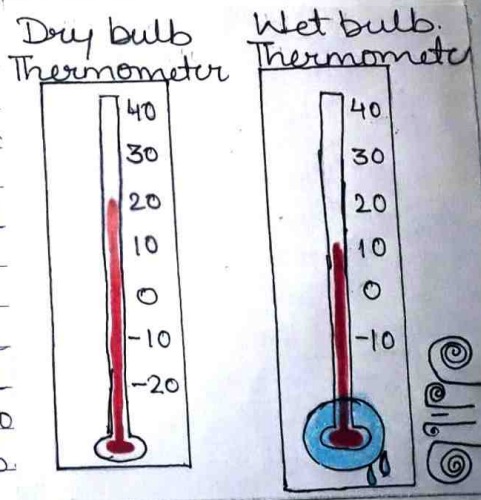
RAIN GUAGE

The amount of rainfall is measured with the help of a rain guage. The rain guage consist of a metal cylinder on which a circular funnel is fitted. The diameter of the funnel's rim is normally 20cm. The rain drops are collected and measured in a measuring glass. Normally, rainfall is measured in the units of millimetres or centimetre. Snow is also measured in a similar manner by turning it into liquid form.

WET & DRY BULB THERMOMETER

This thermometer is used to find out the relative humidity of air. Two ordinary ~~temperature~~ thermometres calibrated according to celsius scale are mounted on a board and hung vertically. The bulb of one of the two thermometers is wrapped in a piece of cloth [cotton's] which is made wet by dipping its other end in distilled water kept in a small glass container. The thermometer whose bulb is wrapped in a piece of wet cloth is called a wet bulb thermometer and the other is called as dry bulb.



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Weather maps

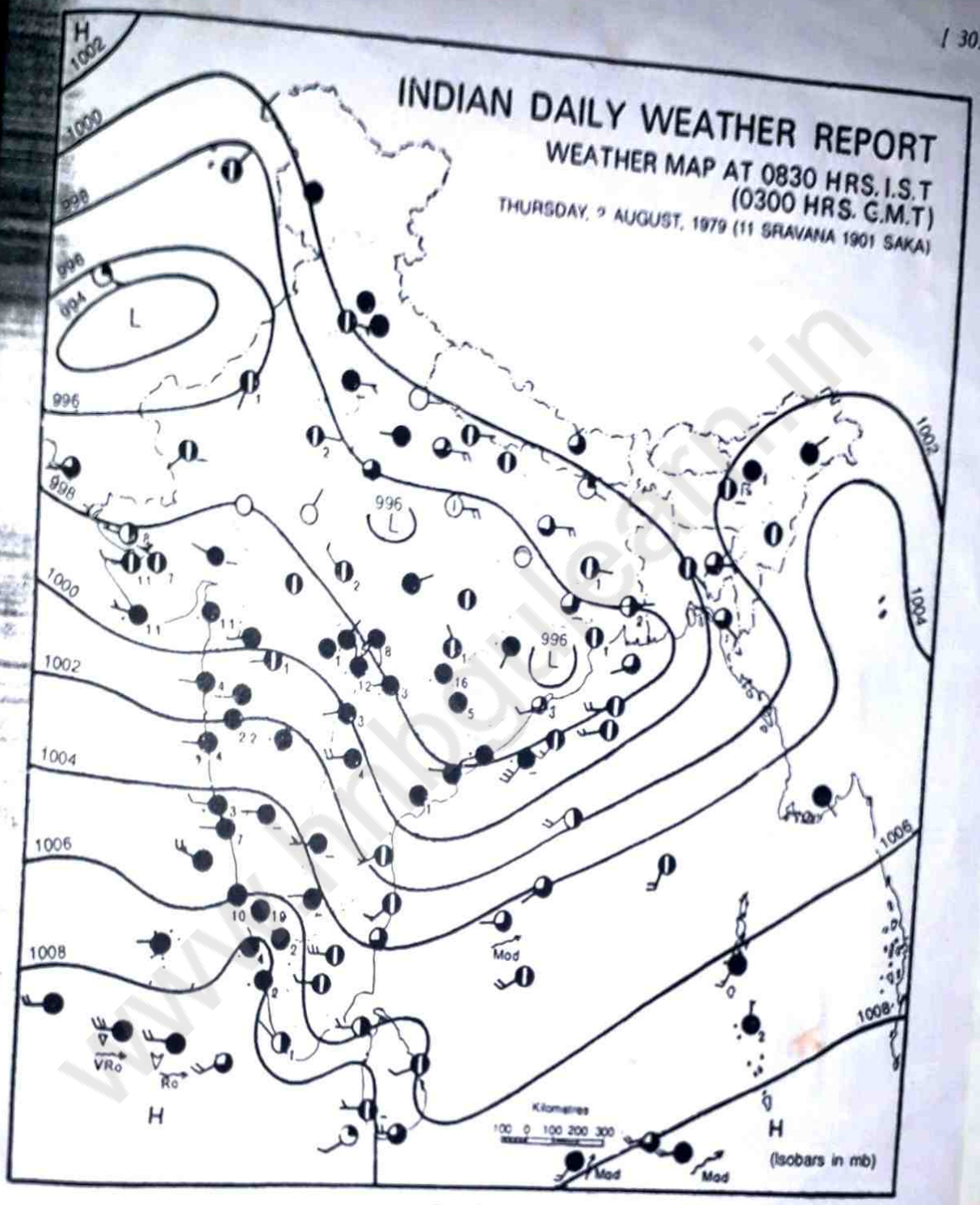
A weather map is the representation of weather phenomena of the earth or a part of it on a flat surface. It depicts surface condition associated with different weather elements such as temp., rainfall, sunshine and cloudiness, direction and velocity of winds, etc. on a particular day. Such observations being taken at fixed hours are transmitted by code to the forecasting stations. The central office keeps a record of the observations, which forms the basis for making a weather map.

Weather Charts - The data received from various weather observatories are in plenty and detailed. As such, they can't be incorporated in one single chart unless the coding designed to give the economy of expression is used. These are called Synoptic weather charts and the codes used are called meterological symbols. Weather charts provide the primary tools for weather forecasting. They help in locating and identifying different air masses, pressure systems, fronts and areas of precipitation.

Weather Symbols - The message received from all the observatories are plotted on the map using weather symbols standarised by the World Meteorological Organisation and the National Weather Bureau.

Weather Symbols

0	Pure Air	▽	Shower of Snow	~	Glazed Frost	⊗	Sky obscured	≡	Moderate Gale	V.Hi	V. High
∞	Haze	▽*	Shower of Snow & Rain	V	Soft Rime	◑	1/2 sky	≡	Fresh Gale	Ph	phenomenal
=	Mist	✱	Soft Hail	V	Hard Rime	▽	Shower	≡	Strong Gale	RAIN	
≡	Fog v < 1km	△	Small Hail	⚡	Gale	◧	1/8 sky	≡	Whole Gale	o	09" neglected
≡	Shallow Fog	▲	Hail	⊙	Sun-Shine	◔	1/4 sky	≡	Storm	○	.18" – .17"
≡	Ground Fog	⚡	Distance Lightning	⊕	Solor Halo	◑	3/8 sky	≡	Hurricane	1/4	.18" – .37"
≡	Frost Fog	⚡	Thunder - Storm	⊃	Lunar Halo	◕	5/8 sky	✕	Mirage	1/2	.38" – .67"
,	Drizzle	✱↓	Drifting Snow (Up)	⊖	Solor Corona	◕	3/4 sky	SEA CONDITION		3/4	.68" – .87"
•	Rain	✱↓	Snow-Strom	∪	Lunar Corona	●	7/8 sky	Cm	Calm	1	.88" – .124"
✱	Snow	✱→	Drifting Snow near the ground	⌒	Rainbow	⌐	Light Air	Sm	Smooth	1 1/2	1.25" – 1.74"
✱	Sleet	8	Dust or Sand Storm	⌒	Aurora Borealis	⌐	Light Breeze	St	Slight	2	1.75" – 2.50"
△	Granular Snow	ε	Dust Devil	◢	Zodiacal Light	⌐	Gentle Breeze	Mod	Moderate	3	2.51" – 3.49"
△	Grains of Ice	⊠	Snow Lying	☀	Clear	⌐	Gentle Breeze	Ro	rough		
↔	Ice Needles	⌐	Hoar Frost	◍	High Cloud	⌐	Moderate Breeze	V.Ro	Very rough		
▽	Shower of Rain	⌒	Dew	●	Overcast Sky	⌐	Strong Breeze	Hi	high		


INDIAN DAILY WEATHER REPORT
WEATHER MAP AT 0830 HRS. I.S.T
(0300 HRS. G.M.T)
THURSDAY, 9 AUGUST, 1979 (11 SRAVANA 1901 SAKA)
H
1002
1000
998
996
994
L
996
998
1000
1002
1004
1006
1008
Mod
VRo
Ro
Kilometres
100 0 100 200 300
(Isobars in mb)

चित्र 11.31

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Weather Map Interpretation

The following map shows the weather condition observed on thursday, August 2, 1979 at 0830 hrs.

1- PRESSURE – (a) location of high bar – An area of high pressure of 1008 mb was located in the South East Bay of Bengal near ~~Andaman~~ Nicobar Island

(b) location of low Bar – The 994 mb isobar marked the boundary of the seasonal low pressure area. It nearly cover whole Baluchistan.

c) Trends of Isobars – In the north the isobars formed a trough the axis of which extended from Southern Sindh to North-West Rajasthan. A trough of low pressure extended over most of Northern plain.

d) Gradient of Pressure – In general the pressure increases from N-W to S-E. In North-West India covering portions of North-East Baluchistan, Southern N.W.F Province and ~~North~~ Centre or south U.P and East Orissa shows local variation in isobar. The rest of area shows uniform rise in pressure.

2. Wind – (a) Direction – Over the Southern half of the Peninsula of Kerala Tamil Nadu, Mysore, Karnataka, Maharastra, Bay of Bengal the wind direction from West to East.

b) Velocity – Wind velocity in South-East part is around less than 3 knots to 5 knots. Moving further towards East In the South of Lakshadweep wind velocity 20-50 knots. In Bay of Bengal it measured 20 knots. In Central India weind velocity is less than 3 knots.

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3) Sky Condition - @ cloud cover. - In Southern India the sky was overcast by clouds. Overcast can be seen in parts of Assam, J&K, Punjab, Haryana, Uttarakhand, There was clear sky noted in parts of Rajasthan and Sikkim.

4) Occurance of Rainfall - Rainfall can be seen in Eastern part of Karnataka as well as part of Assam. It can also be seen near Delhi region.

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DISTRIBUTION MAP

A distribution map is a flexible way of controlling where data is stored in a multi-partition database. These maps can potray social, physical, political, cultural, economic, sociological, agricultural, or any other aspects of a city, state, region, nation or continent. It show segregation, clustering and colour shading.

CHOROPLETH MAP

AIM- Draw a sketch map of uttarakhand and show population by choropleth method.

S.NO	Distt	Population 2011
1	Uttarkashi	329,686
2	Chamoli	391,114
3	Rudraprayag	236,857
4	Tehri Garhwal	616,409
5	Dehradun	1,698,560
6	Garhwal	686,527
7	Pithoragarh	485,993
8	Champawat	259,315
9	Almora	621,927
10	Bageshwar	259,840
11	Nainital	955,128
12	U.S.Nagar	1,648,367
13	Haridwar	1,927,029

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Sol –

Range	Name of Distt	Total no. of states
less than 300,000	Pithoragarh, Rudraprayag, Champawat, Bageshwar	3
300,001 – 600,000	Uttarkashi, Chamoli, Pithoragarh	3
600,001 – 900,000	T. Garhwal, Garhwal, Almora.	3
900,001 – 1200,000	Nainital	1
1200001 – 1500,000	–	0
1500001 – 1800,000	Dehradun, U.S Nagar	2
More than 1800000	Haridwar	1

CONCEPT –

Choropleth is derived from two words 'choros' means 'place' and 'plethos' means 'measure'. choropleth map represent the variation in the distribution of average values per unit area applying various shades to administrative division. Choropleth method is the wrapping method in which the distribution of one element is shown by different shades to represent varying intensity on density among the administrative units. The basic principle is that the intensity of shading should be directly proportional to the density on the intensity of given phenomena.

USES

* These are drawn to represent densities per unit area within political divisions.
* These maps shows population per square kilometer and yield per hectare.
* choropleth maps also shows percentage as for eg – % per area under wheat to the total cropped area
* choropleth maps are drawn for showing density of population per

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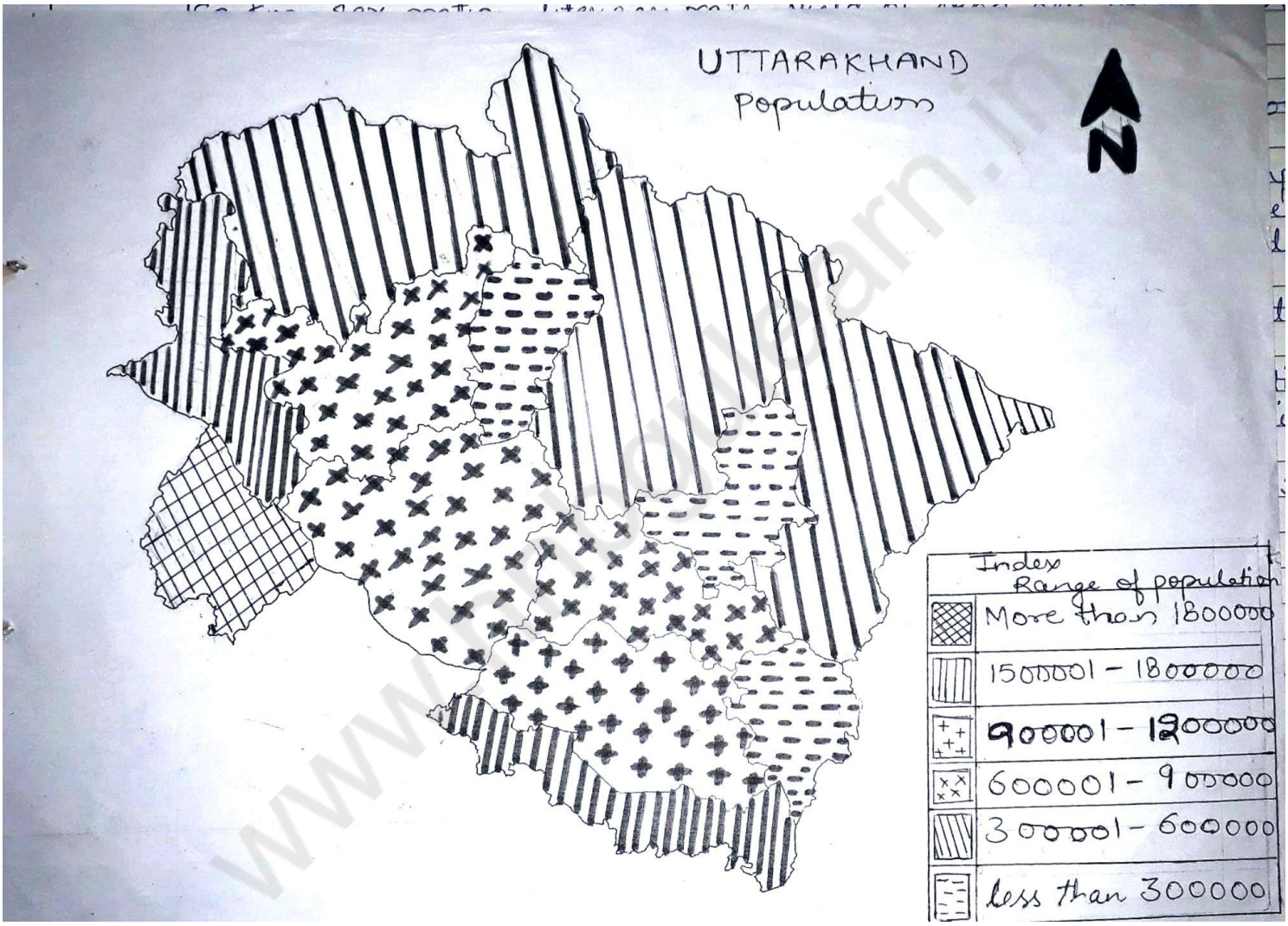

Sq. km, sex ratio, literacy rate, yield of crop per hectare and percentage of area under rice to total cropped area.

MERITS - ▲ A choropleth map represent effectively and with good visual appeal the average value per unit area
▲ It also facilitate comparison of district-wise data and comparison of one choropleth map to other. Level of shading represent a range of value. Low densities are shown by light shade and high densities by dark shade
▲ Choropleth maps give a view of comparative distribution at a glance.

LIMITATION - ● The administrative division shaded with a particular shade indicates that the average value is uniformely distributed in the area.
● The local variation can't be identified which may also be significant sometimes.
● There is an abrupt change from one shade to the other shade with the result that traditional areas are not brought out clearly by choropleth map
● In these map, the densities are rather generalised over quite large area.

DOT METHOD

AIM - To show the distribution of population in ~~Harayana~~ Uttarakhand.

CONCEPT - These map shows the variation in the distribution of quantities by dots of uniform size, each dot representing an absolute figure. In areas where the values of quantities is small, there a small ~~n~~numbers of dots are placed and in areas where the value of quantity is great, there the number of dot is large. Dot ~~these~~ reveal the concentration or spareness of a quantity on an area clearly and effectively.

To prepare a dot map we need an outline map of area showing boundaries of the administrative divisions. The data pertaining to the respective administrative unit should be in absolute figure. eg- number of person living in a district, number of hectare under wheat in a district etc. Topographical sheets, relief maps, soil maps are also shown with dot map. Dot should be round & uniform shape & size. We place the dot at a point where the quantity represented by dot actually occurs when the dot occur over a large area, the dot should be located at the centre of gravity of the area. The knowledge of geographical condition of area is necessary for dot placing. Sandy, stormy & forested area are unimportant for human settlement. The area occupied by lakes, river been left without dots i.e. Negative land.

Unproductive lands are called -ve land, therefore very few dots placed in such areas.

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Methodology – ▲ Round off the population figures. The sizes of district representing the number of person, dot number on dot scale decided.
▲ To decide the dot value find out the maximum and minimum values, the maximum population is 1,927,029 of haridwar district and the minimum population is 236,857 of Rudraprayag district. On this basis we assume that 1 dot represent 15000 person. Then determine the no. of dot in each distt using the following formula: Number of dots = $\frac{\text{Total no. of population}}{\text{Dot Value}}$

S.NO	Name of districts	Population	Calculation	Number of Dots
1.	Haridwar	1,927,029	1927029/15000	128
2.	Dehradun	1,698,560	1698560/15000	113
3.	Udham Singh Nagar	1,648,367	1648367/15000	109
4.	Nainital	955,128	955128/15000	65
5.	Garhwal	686,527	686527/15000	45
6.	Almora	621,927	621927/15000	41
7.	Tehri Garhwal	616,409	616409/15000	41
8.	Pithoragarh	485,993	485993/15000	32
9.	Chamoli	391,114	391114/15000	26
10.	Uttarkashi	329,686	329686/15000	21
11.	Bageshwar	259,840	259840/15000	17
12.	Champawat	259,315	259315/15000	17
13.	Rudraprayag	236,857	236857/15000	15

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USES - Dot map is very useful form for a distribution map representing the quantity or value of dots of uniform size. Such method is useful especially, when values are distributed unevenly. They are drawn to show the distribution of population, cattle population, area under crops, output of commodities, when data is given in absolute figures admistration unit wise.

MERITS - ▲ The distribution of quantity in absolute figure in represented affectively.

▲ Since, dots are placed at a point where the quantity is actually located corelation, between the various geographical conditions affecting the production of that quantity are easily understood from a dot map.

▲ The variation in the concentrations of dots brings out the pattern of distribution clearly and correctly.

LIMITATION - ▲ The Dot maps are small scale map therefore, the position where the dots are not generally accurate. Hence, Dot maps mostly are General map.

▲ Dots can't be used to represent figures as percentage. for eg - The percentage of an area under cotton to the total cropped area. can't be represented by dots.

▲ Attributes with uniform characteristics are not well mapped by dot technique.