3. **Map Projection:**

i. Concept of map projection   (Definition of map projection)

ii. Classification of map projection   (Types of map projection)

iii. Choice of map projection

1. **What is map projection**? (Concept/ Definition)   4

   Ans: Map projection is the method of transferring spherical earth into a flat surface to draw a map. Here the graticule of latitude and longitude is shown on a plain paper. It requires a systematic transformation. In map projection, the three dimensional earth is presented on a two dimensional plane.

   It is the representation of objects and information on a curved surface in a plane using mathematical and geometric relations. Transformation always involves distortion either in size, shape or location. Therefore no map projection is correct.

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2. **Q:**   **Describe the classification of map projection**.   10

   Ans: There are three main types of map projections. They are-
   - a) Cylindrical Projection
   - b) Conical Projection
   - c) Azimuthal or planar projection or zenithal projection

a) Cylindrical Projection:
- ➤ Uses a cylinder as a tangent surface that wraps around a globe
- ➤ The parallels and meridians are straight lines
- ➤ They intersect each other at right angles
- ➤ Direction and shape is correct

➢ The area near to tangent is more correct

➢ Area between 80^{0} north and south is more accurate

➢ Cylindrical projection is three types:

  i. Cylindrical Equal Area Projection

  ii. Gall's Stereographic Projection

  iii. Mercator's Projection

Cylindrical equal area projection:

- The cylinder touch a globe at normal position

- All the parallels and meridians are straight lines crossing at right angle

- Also known as Lambert's projection

Gall's Projection:

- Gall invented this projection

- The cylinder intersect the globe at the 45th parallel north and south

- Less distortion towards poles

Mercator's Projection:

- Mercator invented this projection in 16th century

- Meridians are straight lines and equally spaced

- Parallels are increases as they get closer to the poles

- Shapes are presented more accurately in tangent point areas

b) Conical Projection:

  ➢ Uses a conic surface to touch the globe when light is cast

  ➢ Meridians are semi- circle like ribs of a fan

Types of conical projection:

i. Lambert's conformal conic projection

ii. Simple conic projection with standard parallel

iii. Albert's equal area conic projection

iv. Polyconic projection

c) **Zenithal or Azimuthal map projection**:

➢ Here the flat sheet touch with the globe opposite to the tangent area

➢ The light being cast from the infinite distance of a certain position

➢ This type of map projection *can be classified into three types*:

i. Gnomonic projection

ii. Stereographic projection

iii. Orthographic projection

Gnomonic Projection:

- **Light is at the centre of the globe**
- Less than half of the globe can be projected
- It displays all large circles as straight lines and parallels as curve
- Not suitable for large area

Stereographic projection:

- **Source of light is opposite to the tangent point**
- Meridians are straight lines
- Parallels are circles
- Shape is maintained & used for aviation mapping

Orthographic projection:

- Here only one hemisphere is depicted
- Scale is more correct at the tangent area
- When distance increases from the tangent point, error increases
- **Light is straightly past the globe to touch the polar region**

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