PHOTOGRAMMETRY

The word photogrammetry came into general usage in the field of aerial photography, in the United States about 1934, when the American Society of Photogrammetry was founded. It is derived form three Greek words, **Photos** meaning 'light', **gramma** meaning 'that which is drawn or written', and **meteron** meaning 'to measure'. The root words, therefore originally signifies **measuring graphically by means of light**. Photogrammetry is the science and arts of obtaining reliable measurements by means of photographs. The principles of photogrammetry are important to the photo-interpreter because they are essential to quantifying interpreted terrain features in terms of their location and extent. Photogrammetric analysis procedures can range from obtaining approximate distances and elevations using unsophisticated equipments and simple geometric concepts to obtain extremely precise maps and measurements using sophisticated instrumentation and complex computation techniques. The most common use of photogrammetry is in the preparation of topographic maps from aerial photographs. Photogrammetric techniques are used for mapping in engineering, forestry, geography, geology, planning, soil science and many other fields including defense.
There are two distinct areas in photogrammety:

1) Metric photogrammetry:- Metric photogrammetry consists of making precise measurements from photos and other information sources to determine the relative locations of points, This enables finding distances, angles, areas, volumes, elevations and sizes and shapes of objects. The most common application of metric photogrammetry is the preparation of planimetric and topographic maps from photographs.
2) Interpretative photogrammetry:- Interpretative photogrammetry deals principally in recognizing and identifying objects and judging their significance through careful and systematic analysis. It includes branches of photographic interpretation and remote sensing.

Basic photogrammetric functions:-

1) **Mensuration** – Mensuration consists of following steps:
   a) the identification of control points
   b) the stereoscopic transfer of those points to the photographs
   c) the measurement of photographic co-ordinates of the control points
2) **Rectification and orthorectification**:- Rectification is the process of projecting a photographic image from its plane (photo plane) to a horizontal plane in order to remove displacement due to tilt. Differential rectification or orthorectification is the further correction of the rectified photograph to remove displacement due to relief.
3) **Elevation determination**:- the elevations are determined by an operator using a analog stereo-plotting instrument and manually maintaining a floating mark on the surface of the model while traversing the model along lines of equal elevation.
4) **Planimetric extraction**:- Measurement of distance and angles.

In geological investigations photogrammetric techniques are used to get the following quantitative data:-

1) Horizontal ground distance and angles.
2) Height of objects, buildings etc. from relief displacement.
3) Terrain elevation, Slope and dip by measurement of image parallax.

In this age of computers the PC can be converted into a stereo-plotter and using software for photogrammetry all the tasks involved in the photogrammeteric work can be quickly and accurately done on computers. The generation of DTM (digital terrain model) and profiles can be very easily done using computers. Doing all this with the help of a computer using a software is known as digital Photogrammetry. Some commonly available photogrammetry software are:

1) Orthobase (ERDAS),
2) Ortho Engine (PCI),
3) SAC DEM (SAC),
4) Soft Space (ADRIN)

Q. Write an essay on photogrammetry.

Ans. Include and elaborate following points in the answer:-

1. What is photogrammetry.
2. Geometry of vertical and oblique aerial photograph.
3. Type of measurements, which can be done from photographs.
   a) Measurement of distance and angles
   b) Measurement of height of objects from relief displacement
   c) Measurement of height, slope/dip from parallax measurement
   d) Measurement of thickness of beds

4. Preparation of topographic maps and orthophotos also require precise photogrammetric computations.