

# STUDY MATERIAL

## LESSON -6

### EYES IN THE SKY AND DATA ANALYSIS

1. What is called Remote Sensing : It is the method of collecting information about an object, place or phenomenon with the aid of Satellites without actual physical contact.
2. What are Sensors ? Give examples ? Instrument used for data collection through remote sensing. The sensors record the electromagnetic radiation reflected by objects. Eg: Camera and Scanners.
3. Compare active and passive remote sensing ?  
Active remote Sensing : Remote sensing done with the aid of artificial source of energy  
Passive remote sensing : Remote sensing done with the help of solar energy
4. What is called Platform ? Give examples ? The surface on which the Camera or Scanner for data collection is placed is known as Platform. Examples are balloons, aircraft and satellite.
5. Classify Remote Sensing based on Platform ?  
Terrestrial Photography - Aerial Remote Sensing - Satellite Remote Sensing  
(a) Terrestrial Photography: Capturing photographs of the earth's surface from the earth's surface, preferably from a higher elevation using camera  
(b) Aerial Remote Sensing : The continuous process of capturing photographs of earth's surface using camera mounted on balloons or aircraft  
(c) Satellite Remote Sensing: It is the process of gathering information of the earth's surface using the sensors mounted on satellites
6. Point out major features (merits) and limitations (demerits) of terrestrial photography ?  
Merits : Possible to capture photographs of earth's surface using camera  
Demerits : Only objects covered. Places are not covered
7. Point out features (merits) and limitations of aerial Remote Sensing( Aerial photography) ?  
Merits: Give clear information about comparatively smaller areas  
Demerits :The shaking of aircraft affects the quality of photos, The aircraft requires open space for take off and landing, Picturisation of large area is not practical, Frequent landings for refuelling increase the cost.
8. What is meant by overlap in aerial photographs . What are the uses ?  
During the aerial photography, in each aerial photograph nearly 60% of the places depicted in the adjacent photo is included. This is done for ensuring continuity and to obtain three dimensional vision with the help of Stereoscope.
9. What is stereo pair and stereoscope ?  
Two adjacent aerial photographs are known as a stereo pair. Stereoscope is the instrument that provides three dimensional views from aerial photographs
10. Identify the remote sensing which have overcome the limitations of aerial photography ?  
- satellite remote sensing
11. Identify two types of satellites ? Geostationary Satellites and Sun Synchronous Satellites  
Geostationary Satellites : These are the artificial satellites that move in accordance with the earth's rotation. Example: INSAT series satellites  
Sun Synchronous Satellites: These are the satellites that revolve around the earth along the Poles. Example: IRS
12. What are the features of Geostationary Satellites ?
  - They orbit the earth at an elevation of about 36000 km above the earth
  - 1/3 of the earth comes under its field of view
  - Move corresponds to the speed of rotation of earth
  - Move constantly above a specific place on the earth
  - Helps in continuous data collection of an area
  - It is used in telecommunication and for weather studies

13. What are the features of Sun Synchronous Satellites ?
- Orbit is at an elevation of 1000 km from the earth's surface - The field of view is less
  - Repetitive data collection is possible - Mainly used for remote sensing
  - Used data for collection on natural resources land use and ground water
13. Identify Spectral Signature ? Each object reflects electromagnetic radiation differently. The amount of energy reflected by each object is its spectral signature
10. Identify Spatial Resolution ? The sensors in the satellites cannot recognize all objects on earth. The size of the smallest object on earth that can be recognized by the sensor is the spatial resolution of that sensor
11. Identify satellite imageries ?
- Scanners recognize the different objects on the basis of their spectral signatures and transmit the data to the ground control stations in digital form. These are analysed with the help of computers and transformed into images. These are known as the satellite imageries.
12. List the different sectors where remote sensing is used ?
- ☞ For weather observations      ☞ For ocean explorations      ☞ For understanding land use
  - ☞ For the monitoring of flood and drought
  - ☞ For identifying forest fire in deep forests and to adopt controlling measures
  - ☞ To collect data regarding the extent of crops and spread of pest attack
  - ☞ For oil explorations      ☞ To locate places with ground water potential.
13. What is called Geographic information system (GIS) ?
- Soft wares are used for preparing maps with the help remote sensing and other methods of survey. These soft wares are also used for incorporating more details in the maps and analyzing them for various purposes. This system is known as Geographic information system (GIS)
14. Identify two kinds of data that are necessary for data analysis in Geographic information system
- Spatial data : Each object on the earth's surface has its own latitudinal and longitudinal position.  
Attributes : These are details of layers
15. What is the convenience of using layers in GIS? Spatial information can draw separately using the feature layer. It also help to analyse geographic features easily.
16. Explain analytical capabilities of GIS ?
- a) Network analysis :- The linear features in the map such as road, railway and rivers are subjected to network analysis. The shortest route, routes without toll, routes with less traffic and petrol pumps, hotels and hospitals can be identified using this method.
  - b) Buffer analysis :- It is an analytical capability used for analyzing the activity around a point feature or at a definite distance along a linear feature. We can create a buffer zone in order to find the houses within 3 km radius of a school.
  - c) Overlay analysis :- It is used to identify the interrelationship of various surface features on earth and the changes they have undergone over a period of time. It is helpful in understanding the changes in the area of crops and the changes in land use.
17. What are the uses of GIS ?
- Compile data from different sources
  - Update and incorporate data easily
  - Conduct thematic studies
  - Represent geographic features spatially
  - Generate visual models of future phenomena
  - Prepare maps, tables and graphs
18. What is the use of Satellite Based Navigation System ? map making, transportation etc
19. Identify the importance Global Positioning System (GPS) ?
- It helps sensing the latitudinal and longitudinal location and elevation of objects on the earth's surface
  - In this system a series of 24 satellites placed at Six different orbits between the altitudes 20000 and 20200 km above the earth's surface. The GPS requires signals from at least four satellites to display information like the latitude, longitude, elevation & time in it.