8. Remote Sensing

Exercise

1 A. Question

Maps Created by using aerial photographs are called ..... maps.

A. Ortho photo

B. Aerial Photo

C. Physical

D. Political

Answer

By using aerial photographs, cartographers create detailed maps and these maps are called Orthophoto maps.

1 B. Question

The object under study is known as .....

A. Target

B. Source

C. Sensor

D. Image

Answer

Target is one of the components of remote sensing; it is an object that is being imaged.

1 C. Question

The device to detect the Electro Magnetic Radiation is .....

A. Target

B. Sensor

C. Object

D. Camera

Answer

A sensor is a device which is used to detect EMR that interacts with the target.

2. Question

Match the following.

1. Ground Survey	USA
2. Remote sensing	Many Months
3. Hot air balloon	Systematic aerial image
4. Airplanes	French map makers
5. TIROS	Short span of time
	Geographical information system
	Global Positioning system

Answer

1. Ground survey – Many months

2. Remote sensing – Short span of time

3. Hot air balloon – French map makers

4. Airplanes – Systematic aerial image

5. TIROS – USA

3 A. Question

What is meant by remote sensing?

Answer

Remote sensing refers to the collection of data about an object from far away, without any direct physical contact with the object. Geographers use remote sensing to monitor the Earth's atmosphere, lithosphere, hydrosphere, and biosphere. It is usually done with the help of mechanical devices called sensors.

3 B. Question

What are the disadvantages of ground survey?

Answer

Ground survey suffers from varied disadvantages such as

● Unpredictable weather

● Sandy deserts

● Rugged terrain

● Dense forests

All these disadvantages make ground survey a time-consuming and a tedious process.

3 C. Question

Mention the basic components of remote sensing?

Answer

Remote sensing has four basic components, i.e., target, energy source, transmission path and sensors. A target is an object that is being imaged. The energy source provides electromagnetic energy to the target which is reflected and received through the transmission path by the sensors.

3 D. Question

Define GIS.

Answer

Geographical Information System (GIS) is used for capturing, storing, displaying, updating, manipulating and analyzing all forms of geographical date by systematically integrating computer hardware, software, and spatial data.

3 E. Question

Mention any two applications of GIS.

Answer

● GIS is used for finding prospective areas for exploration and mining

● Power companies use GIS to monitor the electric load on the grid network for a area

● GIS is used to find the shortest route and save time while transporting goods

● Law enforcement agencies use GIS to analyze the patterns of crime incidents

● Ecologists also use GIS to understand the relationships between species distribution and their habitats

3 F. Question

Write any two applications of GPS.

Answer

● GPS is used for military purposes such as navigation, target tracking, missile and projectile guidance, search and rescue, etc.

● The civilian uses of GPS include surveying, map-making, navigation, geofencing and cellular telephony.

● Others uses of GPS include commerce, scientific uses, tracking and surveillance.

4 A. Question

Write about the development of Remote sensing Technology.

Answer

● Remote sensing was first used in 1858 by the French map-makers. They used hot air balloons and primitive cameras to take inclined aerial photographs of the landscape.

● During World War I, air planes were used to take aerial images of the war zone to gather information about the position and movement of the enemy troops

● After the war, aerial images were taken from various angles to create detailed and accurate maps of the territories

● The second revolution in the remote sensing technology began in 1970s with the launch of Earth Resource Technology Satellite (ERTS) which was later renamed as LANDSAT in 1975

4 B. Question

Explain the various components of remote sensing.

Answer

● Target – It is an object that is being imaged.

● Energy source – It provides electromagnetic energy to the target. Energy source can be classified into two

1. Passive system – it is the radiance from the sun

2. Active system – it is the radiance from artificially generated energy sources such as radar

● Transmission path – it is used as a medium to transfer the radiance from the energy source to the target

● Sensor – It is a crucial component; it is a device which detects the electromagnetic radiation. There are two types of sensors, passive sensors, and active sensors. While passive sensors detect the natural radiation that is emitted from an object, active sensors transmit their own signal and measure the energy that is reflected.

4 C. Question

Explain the process involved in remote sensing Technology.

Answer

1. Energy source – This is the first requirement for remote sensing. An energy source is required to provide electromagnetic energy to the target.

2. Atmosphere – The energy travels from its source to the target and passes through the atmosphere

3. Objects on Earth – The energy travels through the atmosphere and interacts with the target, depending on its tone, texture, size, shape, and patterns

4. Recording of energy by the sensor – after energy has been scattered from the target, the sensor collects and records the electromagnetic radiation

5. Transmission, reception, and processing – the energy recorded by the sensor is transmitted in an electronic form to a receiving and processing station to be processed into an image

6. Interpretation and analysis – the processed image is then interpreted and the information about the target is extracted

7. Application – the extracted information is then applied for better understanding and to reveal some new information

4 D. Question

What are the advantages of remote sensing?

Answer

1. Remote sensing provides a synoptic view of a wide area in one single frame

2. Remote sensing helps in detecting features of areas which are out of human reach

3. It is a faster and cheaper method of getting updated information over a geographical area

4. Remote sensing helps the planners in formulating policies and programs to achieve the holistic functioning of the environment

5. One of the most important advantages of remote sensing is its role in preparing thematic maps. It helps cartographers in preparing soil maps, geological maps, etc.