# NCERT SOLUTIONS

## CLASS - 11th



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Class : 11th

Subject : Geography

Chapter : 7

Chapter Name : Introduction to Remote Sensing

Q1 Choose the right answer from the four alternatives given below

(i) Remote sensing of objects can be done through various means such as A. remote sensors, B. human eyes and C. photographic system. Which of the following represents the true order of their evolution.
(a) ABC
(b) BCA
(c) CAB
(d) None of the above

(ii) Which of the following regions of the Electromagnetic spectrum is not used in satellite remote sensing.
(a) Microwave region
(b) Infrared region
(c) X - rays
(d) Visible region

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(iii) Which of the following is not used in visual interpretation technique?
(a) Spatial arrangements of objects
(b) Frequency of tonal change on the image
(c) Location of objects with respect to other objects
(d) Digital image processing

Answer.

(i) -(b) BCA

(ii) -(c ) X- rays

(i) -(b) Frequency of tonal change on the image

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Q2 Answer the following questions in about 30 words.
(i) Why is remote sensing a better technique than other traditional methods?
(ii) Differentiate between IRS and INSAT series of satellites.
(iii) Describe in brief the functioning of pushbroom scanner.

Answer.

(i) Remote sensing is a better technique than other traditional methods because it does not involve physical contact, can be done at any time and irrespective of the weather conditions. Also, the remote sensing technique is more accurate and consumes less time than the traditional methods.

(ii) The difference between IRS and INSAT series of satellites have been listed in the table below:

| | **IRS Satellites** | **INSAT Satellites** |
|---|---|---|
| 1 | This system consists of geosynchronous satellites. | This system consists of geostationary satellites. |
| 2 | The satellites are located at an altitude of 700-900 km. | The satellites are located at an altitude of 36000 km. |
| 3 | They are used for real time positioning purposes. | They are used for telecommunication, search and rescue operations. |

(iii) The pushbroom scanner consists of a number of detectors which are equivalent to the number obtained by dividing the swath of the sensor by the size of the spatial resolution. For example, the swath of High Resolution Visible Radiometer – 1 (HRVR – 1) of the French remote sensing satellite SPOT is 60 km and the spatial resolution is 20 metres. If we divide 60 km x 1000 metres/20 metres, we get a number of 3000 detectors that are deployed in SPOT HRV – 1 sensor. In pushbroom scanner, all detectors are linearly arrayed and each detector collects the energy reflected by the ground cell (pixel) dimensions of 20 metres at a nadir's view.

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Q3 Answer the following questions in about 125 words.

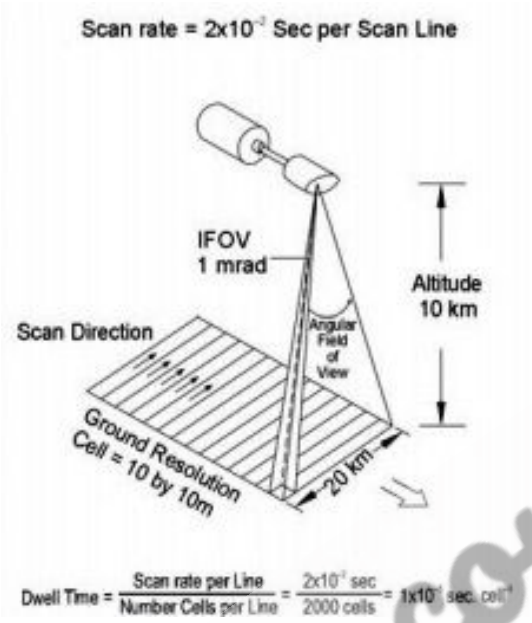
(i) Describe the operation of a whiskbroom scanner with the help of a diagram. Explain how it is different from pushbroom scanner.
(ii) Identify and list the changes that can be observed in the vegetation of Himalayas (Figure below).



Answer.

(i) The whiskbroom scanners are made up of a rotating mirror and a single detector. The mirror is so oriented that when it completes a rotation, the detector sweeps across the field of view between 90° and 120° to obtain images in a large number of narrow spectral bands ranging from visible to middle infrared regions of the spectrum. The total

extent of the oscillating sensor is known as the Total Field of View (TFOV) of the scanner. While scanning the entire field, the sensor's optical head is always placed at a particular dimension called the Instantaneous Field of View (IFOV).




On the other hand, The pushbroom scanner consists of a number of detectors which are equivalent to the number obtained by dividing the swath of the sensor by the size of the spatial resolution. Also, in a pushbroom scanner, all detectors are linearly arrayed and each detector collects the energy reflected by the ground cell (pixel) dimensions of 20 metres at a nadir's view.

(ii) In the left image, the red patches show coniferous vegetation. In the right image, the light red patches which have appeared show the Rabi crops grown in the winter months.

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