# Assignment No. 1

PRN :- 2018BTECS00101

Q.1 Discuss the stages of Remote Sensing.

Answer :-

The technique of acquiring information about an object by recording devices i.e not in physical contact with the object by measuring portion of reflected or emitted electromagnetic radiation from the earth's surface

* Stages of Remote sensing :-

i) Energy source :-
Emission of electromagnetic radiation (EMR) i.e Sun or Self emission is source of energy

ii) Energy Interactions with Atmosphere :-
This stage includes transmission of energy from the source to the surface of the earth as well as Absorption and scattering

iii) Interaction of EMR with the Earth surface :-
This stage includes the reflection and emission of EMR transmitted or absorbed by the surface.

iv) Recording of Energy by the Remote Sensor :-
After the energy has been scattered by, or emitted from the target, we require a sensor, not in touch with earth's surface to collect and record EMR.

v) Sensor Data Output :-
The energy recorded by sensor has to be

has to be transmitted, often in electronic form, to a receiving and processing station where the data are processed into an image.

vi) Data (Image) Processing and Analysis :-
The processed image is interpreted, visually and/or digitally, to extract information about the target which was illuminated.

vii) Application :-
This final stage includes the utilization of extracted information in decision making for solving problems.

Q.2. Discuss the Remote Sensing Platforms and types of Satellite

Answer :-
Platform is a stage to mount the camera or sensors to collect information remotely about an object or surface.

Remote Sensing Platforms are as follows :-
i) Ground
ii) Balloon
iii) Aircraft
iv) Space craft / Satellite.

Types of satellites :-
i) Communications Satellite, ii) Remote Sensing satellite, iii) Navigation Satellite, iv) Geocentric Orbit type Satellite, v) Global Positioning System, vi) Geostationary Satellites, vii) Drone satellite, viii) Ground Satellite, ix) Polar Satellite

Q.3. Define GIS. Explain in detail components of GIS.

Answer :-

I) Geographical Information System (GIS) :-

GIS is defined as a systematic integration of hardware and software for capturing, storing, displaying, updating manipulating and analyzing spatial data.

II) Components of GIS system :-

GIS system can be viewed as an integration of 3 components are hardware and software, data, people.

i) Hardware and Software :-

Hardware relates to device used by end users such as graphic devices or platters and scanners. Data storage and manipulation is done using a range of processor.

Software part relates to the processes used to define, store and manipulate the data and hence it is akin to DBMS. Different models are used to provide efficient means of storage retrieval and manipulation of data.

ii) Data :-

Geographic data are basically divided into mainly 2 main groups are vector and raster

① Vector data -

It refers to discrete objects represented by points, lines and polygons. Lines are formed by connecting two or more points and polygons are closed set of lines.

② Raster data -

It is continuous grid of cells in 2-D or the equivalent of cubic cells in 3-D Raster data are divided conceptually into categorical (every cell value is linked to a category in a separate table) & Continuous (describes continuous phenomena in space).

iii) People :-

People are involved in all phases of development of a GIS system and in collecting data. They include cartographers and surveyors who create the maps and survey the land and the geographical features. They also include system users who collect the data, upload the data to system, manipulate the system and analyze the results.

Q4. Explain vector and raster data format in GIS.

Answer :-

I) Vector data format :-

Vector data / layers in GIS refers to discrete objects represented by points, lines and polygons. Lines are formed by connecting 2 or more points and polygons are closed set of lines. Layers represent geometries that share a common set of attributes. Objects within a layer have mutual topology. Vector sources include digitized maps, features extracted from image surveys and many more.

II) Raster data format :-

Raster data is a continuous grid of cells in 2-D or the equivalent of cubic cells in 3-D. Raster data are divided conceptually into categorical and continuous. In a categorical raster every cell value is linked to a category in a separate table. Examples Soil type, vegetation types, land suitability, and so on. Continuous raster images usually describes continuous phenomena in space such as Digital Elevation Model where each pixel is an elevation value. Unlike categorical raster, a continuous raster doesn't have an attribute / category table attached. Typical Raster sources are aerial images, satellite images and scanned map images.