

# **UNIT XIII: REMOTE SENSING & GIS**

## **Set I**

1. What is remote sensing?

- a) Sending data from one computer to another
- b) Observing the Earth's surface from a distance
- c) Measuring temperature remotely
- d) Transmitting signals through satellite

Correct Answer: b) Observing the Earth's surface from a distance

2. Which electromagnetic spectrum region is primarily used in remote sensing?

- a) Ultraviolet
- b) Visible
- c) Microwave
- d) X-ray

Correct Answer: b) Visible

3. Which satellite remote sensing sensor is commonly used for monitoring vegetation health?

- a) SAR
- b) MODIS

- c) GPS
- d) LIDAR

Correct Answer: b) MODIS

4. What does SAR stand for in remote sensing?

- a) Sunlight and Reflection
- b) Synthetic Aperture Radar
- c) Satellite and Receiver
- d) Spectral Analysis Range

Correct Answer: b) Synthetic Aperture Radar

5. Which of the following is not a passive remote sensing system?

- a) Landsat
- b) MODIS
- c) Radar
- d) AVHRR

Correct Answer: c) Radar

6. What does GIS stand for?

- a) Geographic Information System
- b) Global Information System

- c) Geological Information System
- d) Graphical Information System

Correct Answer: a) Geographic Information System

7. What is the primary purpose of GIS software?

- a) Data collection
- b) Data analysis and visualization
- c) Data transmission
- d) Data storage

Correct Answer: b) Data analysis and visualization

8. Which GIS data type represents discrete, separate features?

- a) Raster
- b) Vector
- c) Image
- d) Point cloud

Correct Answer: b) Vector

9. Which spatial analysis technique combines multiple layers of data to answer questions about spatial relationships?

- a) Buffering
- b) Clipping
- c) Overlay
- d) Sampling

Correct Answer: c) Overlay

10. What is the process of aligning geographic data from different sources into a common coordinate system?

- a) Georeferencing
- b) Digitization
- c) Attribute querying
- d) Cartography

Correct Answer: a) Georeferencing

11. How can remote sensing data be integrated with GIS data?

- a) By printing remote sensing images
- b) By importing remote sensing data as raster layers
- c) By converting remote sensing data to text files
- d) By creating manual sketches of remote sensing scenes

Correct Answer: b) By importing remote sensing data as raster layers

12. What is the term for the process of extracting information from remote sensing data and incorporating it into a GIS?

- a) Data fusion
- b) Data analysis
- c) Data conversion
- d) Data capture

Correct Answer: a) Data fusion

13. Which type of remote sensing data is most suitable for land cover classification in GIS?

- a) SAR data
- b) Thermal infrared data
- c) Hyperspectral data
- d) LiDAR data

Correct Answer: c) Hyperspectral data

14. Which of the following is an example of a GIS application that combines remote sensing and spatial analysis?

- a) Geocoding addresses
- b) Creating thematic maps

- c) Sending emails
- d) Video conferencing

Correct Answer: b) Creating thematic maps

15. What is the advantage of using remote sensing data in GIS for environmental monitoring?

- a) Remote sensing data are cheaper than GIS data
- b) Remote sensing provides real-time data
- c) Remote sensing can capture large areas quickly
- d) Remote sensing does not require specialized software

Correct Answer: c) Remote sensing can capture large areas quickly

16. Which term refers to the process of identifying objects or features in an image based on their spectral characteristics?

- a) Image enhancement
- b) Image classification
- c) Image rectification
- d) Image compression

Correct Answer: b) Image classification

17. What is the primary purpose of orthorectification in remote sensing and GIS?

- a) To create digital elevation models
- b) To correct for geometric distortions in images
- c) To remove clouds from satellite images
- d) To convert vector data to raster format

Correct Answer: b) To correct for geometric distortions in images

18. Which remote sensing platform typically provides the highest spatial resolution imagery?

- a) Satellites
- b) Aircraft
- c) Drones
- d) Weather balloons

Correct Answer: c) Drones

19. What is NDVI used for in remote sensing?

- a) Measuring temperature
- b) Identifying land cover types
- c) Assessing vegetation health
- d) Detecting water bodies

Correct Answer: c) Assessing vegetation health

20. What does LiDAR stand for in remote sensing and GIS?

- a) Light Detection and Ranging
- b) Laser Imaging and Dimension Analysis
- c) Long-Range Infrared Detection and Ranging
- d) Linear Distance and Radiance

Correct Answer: a) Light Detection and Ranging

21. Which of the following is not a type of spatial analysis commonly performed using GIS?

- a) Buffering
- b) Interpolation
- c) Histogram analysis
- d) Network analysis

Correct Answer: c) Histogram analysis

22. In GIS, what is topology?

- a) The study of maps and charts
- b) The study of spatial relationships and connectivity
- c) The study of remote sensing data
- d) The study of geological features



Correct Answer: b) The study of spatial relationships and connectivity

23. What is a GPS receiver commonly used for in GIS applications?

- a) Creating digital elevation models
- b) Collecting geospatial data in the field
- c) Analyzing satellite imagery
- d) Converting vector data to raster format

Correct Answer: b) Collecting geospatial data in the field

24. Which of the following is not a component of a GIS database?

- a) Attribute data
- b) Metadata
- c) Spatial data
- d) Remote sensing images

Correct Answer: d) Remote sensing images

25. Which remote sensing sensor is best suited for capturing high-resolution aerial imagery for GIS applications?

- a) MODIS
- b) Landsat
- c) WorldView-3

d) AVHRR

Correct Answer: c) WorldView-3

26. What is the term for the process of simplifying geographic features for display at smaller scales?

- a) Georeferencing
- b) Generalization
- c) Digitization
- d) Clipping

Correct Answer: b) Generalization

27. Which of the following is an example of a vector data type in GIS?

- a) Digital elevation model (DEM)
- b) Satellite image
- c) Land cover classification map
- d) Shapefile

Correct Answer: d) Shapefile

28. What is the spatial resolution of a remote sensing sensor?

- a) The time it takes for the sensor to capture an image
- b) The size of the pixels in the image

- c) The number of spectral bands in the sensor
- d) The altitude of the sensor above the Earth's surface

Correct Answer: b) The size of the pixels in the image

29. Which type of GIS analysis involves determining the shortest route between two locations?

- a) Buffer analysis
- b) Interpolation
- c) Network analysis
- d) Clipping

Correct Answer: c) Network analysis

30. What is the primary advantage of using LiDAR data in GIS for terrain modeling?

- a) LiDAR data are less expensive than other data sources
- b) LiDAR data can capture underground features
- c) LiDAR data provide highly accurate elevation information
- d) LiDAR data require minimal processing

Correct Answer: c) LiDAR data provide highly accurate elevation information

31. Which of the following is a common application of GIS in urban planning?

- a) Analyzing weather patterns
- b) Monitoring wildlife migration
- c) Managing transportation networks
- d) Studying ocean currents

Correct Answer: c) Managing transportation networks

32. What is the purpose of a GIS attribute table?

- a) To store spatial data
- b) To display aerial imagery
- c) To store and manage attribute data associated with spatial features
- d) To perform georeferencing

Correct Answer: c) To store and manage attribute data associated with spatial features

33. What is the process of converting analog maps and images into digital format?

- a) Remote sensing
- b) Digitization
- c) Data analysis
- d) Data visualization

Correct Answer: b) Digitization

34. Which of the following GIS tools is used for measuring distances and areas on a map?

- a) Buffering
- b) Querying
- c) Geoprocessing
- d) Cartography

Correct Answer: c) Geoprocessing

35. What does the term "spatial analysis" refer to in the context of GIS?

- a) Analyzing data in spreadsheet software
- b) Analyzing data with a focus on time
- c) Analyzing data based on its location and spatial relationships
- d) Analyzing data using machine learning techniques

Correct Answer: c) Analyzing data based on its location and spatial relationships

36. Which of the following GIS data models represents the Earth's surface as a continuous field?

- a) Raster

- b) Vector
- c) Image
- d) Point cloud

Correct Answer: a) Raster

37. What is a geodatabase in GIS?

- a) A type of remote sensing sensor
- b) A digital elevation model
- c) A spatial database that stores geographic data and their relationships
- d) A type of map projection

Correct Answer: c) A spatial database that stores geographic data and their relationships

38. Which of the following is a benefit of using remote sensing for disaster management?

- a) Remote sensing can predict disasters before they occur
- b) Remote sensing can provide real-time information during a disaster
- c) Remote sensing can prevent disasters from happening
- d) Remote sensing is unaffected by natural disasters

Correct Answer: b) Remote sensing can provide real-time information during a disaster

39. What is the purpose of a georeferenced map in GIS?

- a) To show political boundaries
- b) To provide driving directions
- c) To display geographic features in their correct locations on the Earth's surface
- d) To create thematic maps

Correct Answer: c) To display geographic features in their correct locations on the Earth's surface

40. Which remote sensing data type is commonly used to monitor sea surface temperature and ocean currents?

- a) Hyperspectral data
- b) Thermal infrared data
- c) Radar data
- d) LiDAR data

Correct Answer: b) Thermal infrared data

41. In GIS, what is a topology error?

- a) A mistake made during data digitization
- b) A problem with the scale of a map

- c) A type of spatial analysis
- d) An inconsistency in spatial relationships between features

Correct Answer: d) An inconsistency in spatial relationships between features

42. Which GIS analysis tool is used to determine the area that can be reached within a specified distance or time from a given point?

- a) Interpolation
- b) Buffering
- c) Network analysis
- d) Clipping

Correct Answer: b) Buffering

43. What is the primary purpose of geocoding in GIS?

- a) Creating digital elevation models
- b) Converting vector data to raster format
- c) Assigning geographic coordinates to addresses or place names
- d) Analyzing satellite imagery

Correct Answer: c) Assigning geographic coordinates to addresses or place names



44. Which of the following is an example of a GIS application in environmental management?

- a) Tracking stock market trends
- b) Managing a restaurant's menu
- c) Monitoring air quality
- d) Analyzing social media data

Correct Answer: c) Monitoring air quality

45. What is a "hotspot analysis" in GIS?

- a) An analysis of temperature trends
- b) An analysis of crime or disease clusters
- c) An analysis of satellite imagery
- d) An analysis of road networks

Correct Answer: b) An analysis of crime or disease clusters

46. What is the process of converting a 3D surface model into a 2D representation called?

- a) Extrusion
- b) Projection
- c) Interpolation
- d) Generalization

Correct Answer: b) Projection

47. Which GIS tool is used to select features that meet specific criteria or conditions?

- a) Buffering
- b) Clipping
- c) Querying
- d) Digitization

Correct Answer: c) Querying

48. What is the purpose of a legend in a GIS map?

- a) To display the geographic coordinates of features
- b) To provide information about the map's author
- c) To explain the symbols and colors used on the map
- d) To measure distances on the map

Correct Answer: c) To explain the symbols and colors used on the map

49. Which of the following is not a commonly used GIS software package?

- a) ArcGIS
- b) QGIS
- c) AutoCAD

d) GRASS GIS

Correct Answer: c) AutoCAD

50. What is the primary advantage of using open-source GIS software?

- a) It is always free of charge
- b) It is more user-friendly than commercial software
- c) It allows for customization and modification by users
- d) It provides better technical support

Correct Answer: c) It allows for customization and modification by users

## **Set II**

1. What term describes the process of acquiring remote sensing data using instruments mounted on aircraft or satellites?
  - a) In-situ data collection
  - b) Ground truthing
  - c) Remote sensing
  - d) Airborne sensing

Correct Answer: d) Airborne sensing

2. Which of the following is a key advantage of using multispectral remote sensing data?
  - a) High spatial resolution
  - b) Real-time data acquisition
  - c) Ability to capture details of individual objects
  - d) Discrimination of different wavelengths

Correct Answer: d) Discrimination of different wavelengths

3. What is the primary purpose of hyperspectral remote sensing?
  - a) Capturing high-resolution images
  - b) Monitoring atmospheric conditions
  - c) Collecting data at multiple spectral bands
  - d) Tracking the movement of satellites

Correct Answer: c) Collecting data at multiple spectral bands

4. Which GIS tool is used to combine multiple layers of data to create a new layer with information from all input layers?
- a) Overlay
  - b) Merge
  - c) Clip
  - d) Buffer

Correct Answer: a) Overlay

5. Which type of map projection preserves accurate area but distorts shapes?
- a) Mercator projection
  - b) Equal-area projection
  - c) Conic projection
  - d) Cylindrical projection

Correct Answer: b) Equal-area projection

6. What is the main purpose of remote sensing image classification?
- a) Identifying satellite orbits
  - b) Assigning colours to images
  - c) Categorizing pixels into land cover classes
  - d) Georeferencing images

Correct Answer: c) Categorizing pixels into land cover classes

7. Which term refers to the process of converting geographic coordinates into a two-dimensional representation on a flat surface?
- a) Digitization
  - b) Georeferencing
  - c) Map projection
  - d) Cartography

Correct Answer: c) Map projection

8. In GIS, what does the term "geodetic datum" represent?
- a) A data format used for satellite imagery
  - b) A coordinate system used for georeferencing
  - c) A standard model of the Earth's shape and dimensions
  - d) A measurement unit for map scales

Correct Answer: c) A standard model of the Earth's shape and dimensions

9. Which of the following is an example of a vector data model used in GIS?
- a) Digital elevation model (DEM)
  - b) Hyperspectral image
  - c) Shapefile
  - d) LiDAR point cloud

Correct Answer: c) Shapefile

10. What is the term for the process of dividing a raster image into smaller, non-overlapping sections or tiles?

- a) Clipping
- b) Georeferencing
- c) Tiling
- d) Buffering

Correct Answer: c) Tiling

11. Which of the following is a common spatial analysis tool used in network analysis within GIS?

- a) Buffering
- b) Clipping
- c) Routing
- d) Extrusion

Correct Answer: c) Routing

12. What is the primary purpose of a remote sensing satellite's orbit?

- a) To capture images of the entire Earth at once
- b) To remain stationary above a specific location on Earth's surface
- c) To circle the Earth at a fixed altitude and inclination
- d) To transmit data to other satellites

Correct Answer: c) To circle the Earth at a fixed altitude and inclination

13. Which remote sensing technique can be used to measure the distance between the sensor and the Earth's surface?

- a) Multispectral imaging
- b) Spectral analysis
- c) LiDAR
- d) Infrared photography

Correct Answer: c) LiDAR

14. What is the primary application of remote sensing in agriculture?

- a) Monitoring urban development
- b) Mapping mineral resources
- c) Crop monitoring and yield prediction
- d) Studying oceanography

Correct Answer: c) Crop monitoring and yield prediction

15. What is the primary advantage of using synthetic aperture radar (SAR) in remote sensing?

- a) High spatial resolution
- b) Ability to capture visible light
- c) All-weather capability
- d) Low-cost data acquisition

Correct Answer: c) All-weather capability



16. Which of the following GIS data formats is suitable for storing point data, such as the locations of individual trees in a forest?

- a) Raster
- b) Vector
- c) Shapefile
- d) Grid

Correct Answer: b) Vector

17. What is the process of converting analog maps or images into a digital format called?

- a) Geocoding
- b) Digitization
- c) Buffering
- d) Interpolation

Correct Answer: b) Digitization

18. Which of the following is an example of a remote sensing application in disaster management?

- a) Urban planning
- b) Environmental impact assessment
- c) Flood monitoring
- d) Wildlife conservation

Correct Answer: c) Flood monitoring

19. What is the primary advantage of using remote sensing for forest monitoring?

- a) High cost-effectiveness
- b) Ability to collect ground-level data
- c) Rapid and wide-area coverage
- d) Real-time monitoring

Correct Answer: c) Rapid and wide-area coverage

20. Which remote sensing sensor is commonly used to study the Earth's atmosphere and weather patterns?

- a) MODIS
- b) AVHRR
- c) GPS
- d) LiDAR

Correct Answer: b) AVHRR

21. In GIS, what is the purpose of a buffer operation?

- a) To create a digital elevation model
- b) To clip raster data
- c) To measure distances and areas
- d) To identify features within a specified distance of a point, line, or polygon

Correct Answer: d) To identify features within a specified distance of a point, line, or polygon

22. Which remote sensing technology is used for bathymetric mapping of underwater features?

- a) Multispectral imaging
- b) Hyperspectral imaging
- c) Sonar
- d) Thermal infrared imaging

Correct Answer: c) Sonar

23. What does DEM stand for in GIS?

- a) Digital Elevation Model
- b) Digital Environmental Mapping
- c) Data Enhancement Method
- d) Digital Earth Monitoring

Correct Answer: a) Digital Elevation Model

24. Which type of remote sensing data is commonly used for analyzing land cover changes over time?

- a) Hyperspectral data
- b) Thermal infrared data
- c) Multispectral data
- d) Radar data

Correct Answer: c) Multispectral data

25. What is the process of removing redundant or unnecessary data points in a vector dataset called?

- a) Clipping
- b) Simplification
- c) Digitization
- d) Buffering

Correct Answer: b) Simplification

26. What is the term for the process of assigning geographic coordinates to an image to align it with the Earth's surface?

- a) Georeferencing
- b) Digitization
- c) Projection
- d) Buffering

Correct Answer: a) Georeferencing

27. Which GIS analysis tool is used to calculate the area of a polygon feature?

- a) Clipping
- b) Buffering
- c) Interpolation
- d) Polygon area calculation

Correct Answer: d) Polygon area calculation

28. What is the primary application of remote sensing in archaeology?

- a) Monitoring volcanic activity
- b) Studying urban development
- c) Identifying buried archaeological features
- d) Mapping coral reefs

Correct Answer: c) Identifying buried archaeological features

29. Which type of remote sensing data is commonly used for assessing soil moisture levels?

- a) LiDAR data
- b) Thermal infrared data
- c) Radar data
- d) Hyperspectral data

Correct Answer: c) Radar data

30. What is the primary advantage of using GPS in GIS data collection?

- a) High spatial resolution
- b) Ability to collect aerial imagery
- c) Precise location information
- d) All-weather capability

Correct Answer: c) Precise location information

31. Which GIS analysis tool is used to create a new dataset by selecting features that meet specific criteria from an existing dataset?

- a) Georeferencing
- b) Clipping
- c) Querying
- d) Buffering

Correct Answer: c) Querying

32. What is the primary advantage of using LiDAR data for forest canopy analysis?

- a) Ability to capture detailed ground features
- b) High temporal resolution
- c) Accurate measurement of tree heights
- d) Real-time data acquisition

Correct Answer: c) Accurate measurement of tree heights

33. Which GIS analysis tool is used to create a new dataset by extracting a portion of an existing dataset based on a defined boundary?

- a) Clipping
- b) Buffering
- c) Querying
- d) Interpolation

Correct Answer: a) Clipping

34. In remote sensing, what is the purpose of radiometric calibration?

- a) To adjust the satellite's orbit
- b) To correct for geometric distortions in images
- c) To convert spectral data to RGB color
- d) To ensure consistent brightness and contrast in images

Correct Answer: d) To ensure consistent brightness and contrast in images

35. Which remote sensing technique is commonly used to study ocean currents, sea surface temperatures, and marine ecosystems?

- a) Hyperspectral imaging
- b) Thermal infrared imaging
- c) Synthetic Aperture Radar (SAR)
- d) Sonar

Correct Answer: c) Synthetic Aperture Radar (SAR)

36. What is the primary advantage of using LiDAR data for flood modeling and analysis?

- a) Ability to capture high-resolution aerial imagery
- b) Real-time data acquisition
- c) Accurate elevation data for floodplain mapping
- d) Monitoring of atmospheric conditions

Correct Answer: c) Accurate elevation data for floodplain mapping

37. Which remote sensing technique is used for studying the Earth's gravity field and geoid?

- a) Radiometric imaging
- b) Gravimetry
- c) Hyperspectral imaging
- d) Spectral analysis

Correct Answer: b) Gravimetry

38. What is the primary purpose of terrain analysis in GIS?

- a) To analyze changes in climate patterns
- b) To identify geological features
- c) To study the Earth's magnetic field
- d) To analyze the shape and elevation of the Earth's surface

Correct Answer: d) To analyze the shape and elevation of the Earth's surface

39. Which of the following is an example of a GIS application in natural resource management?

- a) Tracking social media trends
- b) Managing retail inventory
- c) Monitoring wildlife migration
- d) Analyzing financial markets

Correct Answer: c) Monitoring wildlife migration



40. What is the purpose of geocoding in GIS?
- a) To create digital elevation models
  - b) To convert vector data to raster format
  - c) To assign geographic coordinates to addresses or locations
  - d) To analyze satellite imagery

Correct Answer: c) To assign geographic coordinates to addresses or locations

41. Which remote sensing technique is commonly used for monitoring air quality and pollutants in the atmosphere?
- a) Thermal infrared imaging
  - b) Multispectral imaging
  - c) Spectral analysis
  - d) Spectroradiometry

Correct Answer: d) Spectroradiometry

42. What is the primary application of remote sensing in environmental impact assessment (EIA)?
- a) Monitoring forest cover
  - b) Studying historical trends
  - c) Evaluating the effects of development projects on the environment
  - d) Analyzing geological features

Correct Answer: c) Evaluating the effects of development projects on the environment

43. Which remote sensing sensor is commonly used for bathymetric mapping of ocean depths?
- a) LiDAR
  - b) Thermal infrared sensor
  - c) Multispectral camera
  - d) Sonar

Correct Answer: d) Sonar

44. In GIS, what does the term "attribute data" refer to?
- a) Geographic coordinates of features
  - b) Information about the physical characteristics of features
  - c) A digital elevation model (DEM)
  - d) Remote sensing images

Correct Answer: b) Information about the physical characteristics of features

45. What is the primary advantage of using remote sensing for land cover classification compared to field surveys?
- a) Lower cost
  - b) Higher accuracy
  - c) Ability to cover large areas quickly
  - d) Collection of ground-level data

Correct Answer: c) Ability to cover large areas quickly

46. Which of the following is a common application of GIS in transportation planning?

- a) Monitoring forest ecosystems
- b) Analyzing underwater archaeology sites
- c) Managing urban parks
- d) Designing road networks

Correct Answer: d) Designing road networks

47. What is the primary purpose of spectral resolution in remote sensing?

- a) To measure the distance between objects
- b) To capture data at multiple spectral bands
- c) To correct geometric distortions in images
- d) To calculate the area of land parcels

Correct Answer: b) To capture data at multiple spectral bands

48. Which remote sensing sensor is commonly used for capturing high-resolution aerial imagery for land use planning?

- a) LiDAR
- b) Hyperspectral sensor
- c) WorldView-3 satellite
- d) GPS receiver

Correct Answer: c) WorldView-3 satellite

49. What is the primary advantage of using aerial photography in remote sensing?

- a) Ability to capture data at night
- b) High spatial resolution
- c) All-weather capability
- d) Real-time data acquisition

Correct Answer: b) High spatial resolution

50. In GIS, what does the term "metadata" refer to?

- a) Digital elevation models (DEMs)
- b) Information about the author of a map
- c) Data about the data, such as data source, date of acquisition, and accuracy
- d) The process of converting vector data to raster format

Correct Answer: c) Data about the data, such as data source, date of acquisition, and accuracy