

MA/ M.Sc. GEOGRAPHY
FOURTH SEMESTER
APPLICATIONS OF GEOINFORMATICS
MGE - 402A
(USE OMR FOR OBJECTIVE PART)

SET
A

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

(Objective)

Marks: 20

Choose the correct answer from the following:

1×20=20

1. What type of satellite data is commonly used for flood inundation mapping?
 - a. Optical imagery
 - b. Radar imagery
 - c. Infrared imagery
 - d. Ultraviolet imagery
2. Which type of remote sensing imagery is commonly used for detecting forest fires?
 - a. Thermal infrared imagery
 - b. Visible spectrum imagery
 - c. Microwave imagery
 - d. Ultraviolet imagery
3. Which satellite mission provides global elevation data that can be used for flood modeling and mapping purposes?
 - a. Landsat
 - b. Sentinel-2
 - c. TerraSAR-X
 - d. Shuttle Radar Topography Mission (SRTM)
4. How can remote sensing data assist in assessing the impact of natural hazards on urban areas?
 - a. By providing real-time video footage of the hazard event
 - b. By mapping affected areas and infrastructure damage
 - c. By measuring soil moisture content in urban parks
 - d. By analyzing traffic patterns during evacuation
5. What role does geoinformatics play in managing waste disposal sites?
 - a. By manufacturing waste bins
 - b. By analyzing spatial data to identify suitable locations for waste disposal facilities using GIS
 - c. By designing plastic bags
 - d. By managing paper recycling plants
6. Which remote sensing sensor is commonly used to measure atmospheric greenhouse gas concentrations?
 - a. Optical sensors
 - b. Radar sensors
 - c. LiDAR sensors
 - d. Spectroradiometers
7. Which satellite sensor is used to monitor changes in vegetation cover and land surface conditions?
 - a. Synthetic Aperture Radar (SAR)
 - b. Visible and Near-Infrared (VNIR) sensors
 - c. Microwave Radiometer
 - d. Lidar

8. How can GIS technology enhance emergency response during flash floods?
 - a. Simulating rainfall patterns using climate models
 - b. Calculating the volume of water in a flooded area
 - c. Assessing the impact of floods on wildlife habitats
 - d. Optimizing evacuation routes based on real-time data
9. Which spatial analysis technique in GIS is crucial for understanding the flow of water during floods?
 - a. Buffering of water bodies in urban areas
 - b. Interpolation of rainfall data
 - c. Overlay analysis of land cover types
 - d. Network analysis of drainage systems
10. What role does LiDAR (Light Detection and Ranging) technology play in the development of smart cities and villages through geoinformatics?
 - a. LiDAR data provides high-resolution topographic information for urban and rural planning and infrastructure development
 - b. LiDAR enables real-time monitoring of air and water quality in smart city environments
 - c. LiDAR technology facilitates the creation of 3D virtual reality models for citizen engagement in village planning
 - d. LiDAR data supports precision agriculture and soil fertility mapping in smart villages
11. Which of the following geoinformatics tools and techniques can be applied to optimize the routing and scheduling of waste collection vehicles in smart cities?
 - a. Geographic Information Systems
 - b. Remote Sensing
 - c. Global Positioning Systems
 - d. Spatial statistics
12. Which of the following spatial analysis techniques in geoinformatics can be used to identify optimal locations for public infrastructure such as schools and hospitals in a smart city or village?
 - a. Spatial autocorrelation
 - b. Network analysis
 - c. Spatial interpolation
 - d. Geostatistics
13. How can geoinformatics be used to analyze the impact of land use changes on sediment transport in a watershed?
 - a. Overlaying land use maps with soil erosion maps
 - b. Using LiDAR data to model surface topography
 - c. Interpolation rainfall data using kriging technique
 - d. Calculating stream flow using hydrological models
14. Which of the following geoinformatics applications is most useful for analyzing groundwater flow in a hydrological study?
 - a. Geographic Information System
 - b. Remote Sensing
 - c. Digital Elevation Models
 - d. Global Positioning System

15. Which of the following geoinformatics applications is most beneficial for assessing soil moisture distribution within a watershed?
- a. Synthetic Aperture Radar imagery
 - b. Digital Soil Mapping
 - c. Bathymetric LiDAR
 - d. Unmanned Aerial Vehicle imagery
16. Which of the following LULC falls under Level-II category of NRSC LULC classification?
- a. Crop Land
 - b. Fallow
 - c. Plantation
 - d. All of above
17. Abandoned shifting cultivation falls under _____ category in NRSC LULC classification system.
- a. barren land
 - b. agriculture
 - c. scrub forest
 - d. None of above
18. Which of the following do not falls under inland wetland type?
- a. cut-off meander
 - b. Saltpans
 - c. ox-bow lake
 - d. None of above
19. Which of the following LULC class falls under Level-III category of Anderson classification?
- a. Pastures
 - b. Cropland
 - c. Both of above
 - d. None of above
20. What level of LULC classification is usually carried out using data between 1:20,000 to 1:80,000 scale?
- a. Level I
 - b. Level II
 - c. Level III
 - d. Level IV

(Descriptive)

Time : 2 hrs. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Critically discuss the LULC classification system upto Level II of USGS Anderson classification. 10

2. Write short note (*any two*) 5+5=10
 - a. Interpretation keys to identify different types of forest cover
 - b. NRSC classification system
 - c. Applications of geoinformatics in natural resource management

3. Discuss the importance of geoinformatics in urban sprawl mapping and development planning for flood-prone areas. Provide examples to support your answer. 3+3+4=10

4. Describe the process of groundwater potential studies using geoinformatics. Explain how geospatial analysis can help in assessing groundwater resources and planning sustainable water management practices. 5+5=10

5. Explain the significance of drainage basin morphometry in hydrological studies. How can basin morphometric parameters help in water resource management? 4+6=10

6. Evaluate the effectiveness of geoinformatics in supporting climate change research and policy-making efforts. 10

7. Discuss the importance of geospatial technology in monitoring and mitigation of natural hazards on the earth surface. 10

8. How and to what extent the pattern of changing biodiversity can be detected by geospatial technology? Explain 10

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