

Question:

What is role of Remote Sensing and GIS in environmental sciences? Discuss Briefly.

Answer:

### Introduction To Remote Sensing and GIS:

- ① Remote Sensing: Remote sensing involves acquiring information about Earth's surface without direct contact, using satellite or aerial sensors. These sensors capture data in various wavelengths, including visible, infrared, and microwave, enabling the monitoring of land, water, and atmospheric conditions.
- ② Geographic Information System (GIS): GIS is a framework of gathering, managing and analyzing spatial and geographic data. It combines data from various sources to create layered maps and models, allowing users to visualize, interpret, and understand spatial relationships and patterns.

## Role of Remote Sensing and GIS in Environmental Sciences

### ① Monitoring and assessing Environmental

Changes: Remote sensing and GIS are invaluable for monitoring environmental changes over time. Satellites equipped with sensors capture images and data on land use, vegetation cover, waterbodies, and atmospheric conditions. These images are analyzed to detect changes in land cover, deforestation, urban expansion and the health of ecosystems. GIS integrates this data with other spatial information to create detailed maps and models, allowing scientists to assess the extent and impact of environmental changes accurately.

### ② Disaster Management and Mitigation:

Remote sensing provides real-time data crucial for disaster management. During natural disasters such as floods, hurricanes and wildfires, satellite images help track the event's progression, assess damage and coordinate response efforts. GIS Tools are used to map disaster prone areas, predict the impact of potential disasters, and plan evaluation

routes and resource allocation.

### ③ Water resource Management:

Remote sensing provides data on water bodies, their extent and quality. It helps in monitoring changes in river flow, reservoir levels and groundwater resources. GIS is used to model water distribution networks, assess water availability, and plan sustainable water management practices.

### ④ Urban Planning and Sustainable

Development: GIS and remote sensing are essential tools for urban planning and sustainable development. Satellite images provide information on urban growth, land use patterns, and infrastructure development. GIS integrates this data with socio-economic information to create urban models, helping planners design sustainable cities, optimize land use and reduce environmental impact.

### Conclusion:

In conclusion, remote sensing and GIS are integral to environmental science, offering tools and techniques for

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monitoring, analyzing and managing  
the environment.

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