

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY GURAJADA VIZIANAGARAM
IV B. Tech I Semester Regular/Supplementary Examinations OCT/NOV 2025
GEO-SPATIAL TECHNOLOGIES

(CE)

Time: 3 hours

Max. Marks: 70

Answer any **FIVE** Questions **ONE** Question from **Each unit**

All Questions Carry Equal Marks

UNIT-I

1. a) Explain the basic concept of a Geographical Information System (GIS). How does it differ from traditional mapping systems? [7M]
b) Define map, and explain how point, line, and polygon features are represented in GIS. Give one practical example for each. [7M]
(OR)
2. a) Describe the fundamental operations of GIS and illustrate how GIS helps in urban planning or resource management with a suitable example. [7M]
b) Discuss the importance of map projections in GIS. Compare any two types of projections and explain the errors that may occur during transformations. [7M]

UNIT-II

3. a) Differentiate between spatial and non-spatial (attribute) data with suitable examples. How are they interrelated in GIS applications? [7M]
b) Explain various data input techniques in GIS such as manual digitizing, scanning, and remote sensing. Discuss their advantages and limitations. [7M]
(OR)
4. a) Explain the process of GIS data storage and maintenance. How does metadata help in data management? [7M]
b) Explain different types of errors in GIS data such as geometric and radiometric errors. [7M]

UNIT-III

5. a) What is data retrieval in GIS? Explain how spatial and attribute queries are performed. [7M]
b) Describe the concept of recode and overlay analysis. How are these used in land suitability studies? [7M]
(OR)
6. a) Define a Digital Elevation Model (DEM). Discuss its role in terrain analysis and watershed delineation. [7M]
b) What is buffer analysis? Explain its process and importance with an example. [7M]

UNIT-IV

7. a) Describe how GIS supports soil mapping and classification. Explain with an example. [7M]
b) Explain the process of land use planning using GIS. Mention key layers of data required for analysis. [7M]
(OR)
8. a) List and describe any four standard GIS software packages with their key features. [7M]
b) Explain the basic working principle of the Global Positioning System (GPS) and its components. [7M]

UNIT-V

9. a) Describe the major components of a remote sensing system and their interrelationships. [7M]
b) Explain the basic characteristics of electromagnetic radiation used in remote sensing. [7M]

(OR)

10. a) Explain the main steps in digital image processing — image enhancement, classification, and interpretation. [7M]
b) Write short notes on the Indian Remote Sensing (IRS) satellite series and their applications. [7M]
