

GUJARAT TECHNOLOGICAL UNIVERSITY
BACHELOR OF ENGINEERING – SEMESTER 5 – EXAMINATION – SUMMER 2026

Subject Code: 3150617

Date: 21/05/2026

Subject Name: Remote Sensing and GIS

Time: 02:30 PM TO 05:00 PM

Total Marks: 70

Instructions:

- 1. Attempt all questions.**
- 2. Make suitable assumptions wherever necessary.**
- 3. Figures to the right indicate full marks.**
- 4. Simple and non-programmable scientific calculators are allowed.**

- Q.1**
- (a) Differentiate between Active and Passive Remote Sensing. **03**
 - (b) Discuss the interaction of EMR with the Earth's surface features. **04**
 - (c) Discuss the Electromagnetic Spectrum in detail and explain how different regions are used for various remote sensing applications. **07**
- Q.2**
- (a) List different data formats of digital images. **03**
 - (b) Describe different types of imaging sensors (CCD and CMOS). **04**
 - (c) Explain in detail the process of digital image formation using imaging sensors, including types and characteristics. **07**
- OR**
- Q.2**
- (c) Analyze how image interpretation keys and processing techniques help in extracting information from digital images. **07**
- Q.3**
- (a) Differentiate between geographic and projected coordinate systems. **03**
 - (b) Explain the concept of georeferencing frameworks. **04**
 - (c) Analyze how GIS techniques can be used for decision-making, such as site selection or land-use planning. **07**
- OR**
- Q.3**
- (a) Discuss data retrieval and output functions in GIS. **03**
 - (b) Explain buffering and its applications in GIS. **04**
 - (c) Describe the georeferencing process and reference coordinate systems, including datum and transformation methods. **07**
- Q.4**
- (a) Differentiate between spatial data and attribute data with examples. **03**
 - (b) Discuss the importance of data management in GIS. **04**
 - (c) Describe the complete process of GIS data input, processing, and output, with suitable examples. **07**
- OR**
- Q.4**
- (a) Explain fundamentals of data quality (accuracy, precision, completeness). **03**
 - (b) Explain the concept of georeferenced data. **04**
 - (c) Explain in detail the components of GIS and their functions with a neat diagram **07**

- Q.5** (a) Explain how attribute tables are linked with spatial data. **03**
- (b) Describe data management in public domain GIS software. **04**
- (c) Discuss the role and usefulness of GIS and Remote Sensing in civil engineering projects with real-life examples. **07**

OR

- Q.5** (a) Describe the capabilities of GIS software in spatial analysis and mapping **03**
- (b) Compare open-source and commercial GIS software **04**
- (c) Explain a case study (e.g., flood hazard mapping, urban planning, transportation planning) using GIS and Remote Sensing techniques. **07**
