**Name:**

**Enrolment No:**

**UPES**

**End Semester Examination, May 2025**

**Course: B,Sc Geology Honors** **Semester: IV**

**Program: Remote Sensing and GIS** **Time : 03 hrs.**

**Course Code: PEGS 2057** **Max. Marks: 100**

**Instructions: Answer any two questions from Section C**

**SECTION A**
**(5Qx4M=20Marks)**

| S. No. | | Marks | CO |
|---|---|---|---|
| Q 1 | Differentiate between a large-scale map and a small-scale map with examples. | **4** | **CO1** |
| Q 2 | Illustrate the importance of a standard parallel using a diagram. Which projection has one standard parallel and which has two standard parallels. | **4** | **CO2** |
| Q 3 | List any four environmental settings that should be set before you start geoprocessing on raster/vector data. | **4** | **CO3** |
| Q 4 | a) What does an Image histogram represent?<br>b) Differentiate between a polar orbit and a geostationary orbit. Give at least one example of a satellite in a polar orbit and in a geostationary orbit. | **2+2** | **CO4** |
| Q 5 | List 4 important advantages that remote sensing offers over other methods of data collection? | **4** | **CO4** |

**SECTION B**
**(4Qx10M= 40 Marks)**

| | | | |
|---|---|---|---|
| Q 6 | What is Raster Map Algebra, and the different Boolean operators used in Raster analysis? Draw the truth table for each operator.<br><br>OR<br><br>Describe five different types of network analyses (created after a geometric network is modeled) that can be performed in GIS and provide an example of who might benefit from each kind of analysis? | **10** | **CO3** |
| Q 7 | Below is a real-world problem. Describe the types of data, methods and functions you would use to propose a GIS solution to the problem. Also draw a flowchart depicting the same.<br>**Problem**: Find potential locations for a new landfill using these criteria<br>• On flat terrain <= 10 degrees slope<br>• No more than 1 km from an existing road<br>• At least 500 meters from a stream | **10** | **CO1** |

| | | | |
|---|---|---|---|
| | • Meadow or low-density forest (Some and not all vegetation types are good)<br><br>• You need to develop a **Boolean raster** for each condition with 1 = desirable area, 0 = not desirable area | | |
| Q 8 | a) Describe what type of resolution is this and what character is the sensor measuring in each case?<br>i. The resolution of Landsat Thematic Mapper sensor is 30m.<br>ii. The resolution of Landsat Thematic Mapper is 16 days.<br>iii. The resolution of Landsat Thematic Mapper is 8 bits. | **2 X 3 = 6** | **CO4** |
| | b) Analyze the advantage of a false color composite image over a true color composite for solving remote sensing-based applications. | **4** | |
| Q 9 | What is resampling of raster data and why is it required. Explain the different resampling methods with proper diagrams. | **10** | **CO3** |
| **SECTION-C Answer ANY TWO questions (2Qx20M=40 Marks)** | | | |
| Q 10 | Describe the two different types of coordinate systems in GIS, showing how coordinates are measured in each system. Draw suitable diagrams. | **20** | **CO3** |
| Q 11 | Give the steps involved in a geodatabase development process, detailing what needs to be specified at each of the conceptual, logical, and physical design phases. | **20** | **CO2** |
| Q 12 | a) Differentiate between active sensors and passive sensors. Give one example of each type of sensor. | **5** | **CO4** |
| | b) Differentiate between a multispectral sensor and a hyperspectral sensor? Draw suitable diagrams to illustrate the concept. | **5** | |
| | c) Explain the advantage of displaying various wavelength ranges or channels, in combination as color images as opposed to examining each of the images individually. Give a suitable example. | **10** | |