B. Sc. Geological Sciences Examination, 2024

(3rd Year, 2nd Semester, Special Supplementary)

Geomorphology, Remote Sensing and GIS-Theory

Paper – CORE/TH/13

Time : Two hours Full Marks : 40

(Use a separate Answer script for each Part)

PART – I (20 Marks)

Answer the Question **No. 1** and any ***two*** from the rest.

1. Write short notes on (answer any ***four***): 4 $2\frac{1}{2}$ 10
   i) Bajada
   ii) Butte
   iii) Inselberg
   iv) Pediment
   v) Radial drainage pattern
   vi) Knickpoint
2. What do you understand by landform and landscape? What is pedalfar? Draw an ideal soil profile. How is it modified in different climatic conditions? 5
3. a) Define base level of erosion. How does it alter?
   b) How does liquefaction regulate mass-wasting? 5
4. What are the characteristic landorm features of the youth, mature and old stages of a fluvial cycle? 5

5. Describe briefly the various erosional and depositional landforms resulting out of coastal processes. 5

PART – II (20 Marks)

Answer the Question **No. 1** and any ***three*** from the rest.

1. Fill in the blanks : 1×5

   i) The primary function of NDVI (Normalized Difference Vegetation Index) is to assess the _____ of vegetation.

   ii) In remote sensing, _____ is the scattering of light by particles much smaller than the wavelength of the light.

   iii) The geostationary orbit is positioned above the _____ and is primarily used for _____.

   iv) A multispectral image captures data across _____ specific bands of the electromagnetic spectrum.

   v) GPS (Global Positioning System) provides location information by utilizing _____ signals from satellites.

2. a) Differentiate between spatial, spectral, temporal, and radiometric resolution in remote sensing.

   b) What is Instantaneous Field of View (IFOV)? 4+1

3. a) Explain the main differences between raster and vector data models.

   b) Why is the modification of digital numbers (DNs) in an image important? $2\frac{1}{2}$ $2\frac{1}{2}$

4. a) Compare supervised and unsupervised image classification techniques, providing examples of their applications.

   b) With an example explain how different portions of the electromagnetic spectrum are utilized in remote sensing to study various surface features such as vegetation and water bodies. $2\frac{1}{2}$ $2\frac{1}{2}$

5. a) Explain the importance of DEM (Digital Elevation Models) in earth sciences and remote sensing applications.

   b) Explain the concept of geostationary orbit and how it differs from sun-synchronous orbit. $2\frac{1}{2}$ $2\frac{1}{2}$

6. a) Differentiate between True Color Composites and False Color Composites in remote sensing.

   b) How do atmospheric windows affect remote sensing observations? 3+2