

Ex/SC/GEOG/UG/MAJOR/TH/21/208/2025

BACHELOR OF SCIENCE EXAMINATION, 2025

(2nd Year, 1st Semester)

GEOGRAPHY

COURSE CODE : SC/GEOG/UG/MAJOR/TH/21/208

(Basics of Remote Sensing)

Time : Four Hours

Full Marks : 50

Answer **all** questions.

1. Define atmospheric scattering and state the relationship of different types of scattering with atmospheric phenomena and remote sensing. A wetland is covered by 155 dots on a 50-dot/sq. cm grid on a 1 : 40,000 scale airborne image. Find out the ground area covered by the wetland. Mention the applications of a passive microwave remote sensor.

4+3+3=10

(OR)

Explain briefly the significance of using wavelength range of 8-14 μ m in remote sensing. Name four satellites carrying sensors working in 8-14 μ m spectral range. Calculate the DN value of a pixel of Landsat TM image (8-bit data) using the following parameters: $L_{MIN_e} = -2.8 \text{ watts m}^{-2}\text{ster}^{-1}\mu\text{m}^{-1}$; $L_{MAX_e} = 296.5 \text{ watts m}^{-2}\text{ster}^{-1}\mu\text{m}^{-1}$; Surface reflectance = 68%; Earth-Sun distance in astronomical units = 1.0165;

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[Turn Over]

(2)

Mean atmospheric irradiance = $1826 \text{ W/m}^2 \mu\text{m}$; Solar zenith range = 88° ; Path radiance = $0 \text{ W/m}^2 \mu\text{m}$; Atmospheric transmittance in the viewing direction = 1; Atmospheric transmittance in the illumination direction = 1. 4+2+4=10

2. Analyse the methods of radiometric corrections of an image. Differentiate between Pushbroom and Whiskbroom types of sensors. What is NDWI? 4+4+2=10

(OR)

Mention the salient features of BIL, BSQ and BIP data formats. What is run-length encoding? How does the 'histogram equalization' technique help in image quality enhancement? 3+3+4=10

3. Generate a standard false colour composite from the given set of spectral bands. Also subset the FCC using the given vector file. 10
4. Prepare a landuse and landcover maps from the given image. 10

Internal Assessment

10

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