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**B.TECH. VI SEM MAIN/BACK EXAM  
AUGUST 2023  
CIVIL ENGINEERING  
(6CE5-16) - GEOGRAPHIC INFORMATION  
SYSTEM & REMOTE SENSING**

Time : 2 Hours]

[Max. Marks : 80

[Min. Passing Marks : 30

**Instructions to Candidates :** Part – A: Short answer type questions (up to 25 words)

5 × 2 marks = 10 marks. All 5 questions are compulsory.

Part – B: Analytical/Problem Solving questions 4 × 10 marks = 40 marks. Candidates have to answer 4 questions out of 6.

Part – C: Descriptive/Analytical/Problem Solving questions 2 × 15 marks = 30 marks. Candidates have to answer 2 questions out of 3.

Schematic diagrams must be shown wherever necessary. Any data you feel missing may suitably be assumed and stated clearly. Units of quantities used/calculated must be stated clearly.

Use of following supporting materials is permitted during examination. (Mentioned in form No. 205)

1 : NIL

2 : NIL

**PART A**

1. Define the types of aerial photographs.
2. Define spectral signatures.
3. Define the wavelength classification of electromagnetic radiation.
4. Differentiate spectral and spatial resolution.
5. Define the two basic data classification used in GIS.

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## PART B

1. What is relief displacement in a vertical photograph? Derive the relation between the relief displacement and the height above datum with an appropriate diagram.
2. Explain the differences between monochromatic, multispectral, hyperspectral and ultraspectral sensors with examples.
3. What is stereoscopic parallex? Define and explain the parallax equations.
4. Define schematically the principal of a single lens frame aerial camera.
5. A flight plan for an area 10 miles wide and 15 miles long is required. The average terrain in the area is 1500 ft above datum. The camera has a 6 inch focal length with  $9 \times 9$  inch format. Consider the endlap and overlap to be 60% and 25%, respectively, and the photographic scale to be 1 : 12000 (1000 ft/inch).
6. Define any four spatial filtering methods in image processing.

## PART C

1. Explain the remote sensing system with a schematic diagram.
2. What is tilt distortion? Prove that in a tilted photograph, tilt distortion is radial from isocentre.
3. Explain in detail what are thematic maps and how they are generated with an example.

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