

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2023

B.Tech-VIII Semester (ECE)

COURSE CODE(CREDITS): 19B1WEC837 (3)

MAX. MARKS: 35

COURSE NAME: Remote Sensing and Satellite Image Processing

COURSE INSTRUCTORS: Lt. Pragya Gupta

MAX. TIME: 2 Hour

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*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems.*

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Q1. Explain the errors commonly encountered due to sensor malfunctioning? How can these errors be corrected using Histogram based approach?

[5]

Q2. (a) List some of the consequences of increasing spatial resolution from 80 m to 40 m of the digital remote sensing system. What would be some of the consequences of decreasing detail from 80 m to 160 m?

(b) Explain how SNR varies with spatial and spectral resolutions.

[2.5 X 2 = 5]

Q3. Draw the chromaticity diagram and explain it in detail.

[5]

Q4. (a) Why are more frequent images available for the polar regions as compared to equatorial regions? Explain with a proper diagram. How can more frequent imaging of any particular area of interest be achieved?

(b) Define the repeat cycle and orbit period of a satellite. What is the repeat cycle and orbit period of Landsat satellites?

[3+2=5]

Q5. What are the stages of Remote sensing? Give the advantages and disadvantages of space-borne and air-borne remote sensing.

[5]

Q6. Short answer question:

- a. How does IFOV vary with angle of view?
- b. How many bit RGB colour images are represented by full-colour image?
- c. What is Polar and Sun synchronous orbit?
- d. Suppose you have a digital image which has a radiometric resolution of 6 bits. What is the maximum value of the digital number which could be represented in that image?
- e. What is the equation for calculating G (green) value in terms of HSI components?
- f. What is the equation used to obtain I (Intensity) component of each RGB pixel in RGB colour format?
- g. Define Specular and Lambertian reflection.
- h. How do we express total radiance mathematically recorded by the sensor?
- i. What is Wien's Displacement Law?
- j. Define Apogee and Perigee.

[1X10 =10]