Mid Sem Exam **3rd April 2025**

INTERNATIONAL INSTITUTE OF INFORMATION TECHNOLOGY

Introduction to Spatial Science

Time:60 minutes ***Total Marks:*** **30**

Note: Put the question number and write the answer

Section: I (5 Marks)

1. What is/are
   a. Atmospheric blinds b. Nadir c. Radiometric resolution
   d. Radiance e. Albedo

Section: II (5 Marks)

2. Give the formula for any one vegetation index
3. What is the urban growth model shown in the class?
4. What is the advantage of microwave data over optical data?
5. Why there is misclassification of classes in supervised classification approach despite taking homogenous training sets?
6. Spatial data represented as Maps do not capture the following –
   a. Geometric information b. Geographic information
   c. Population d. Differences between features

Section-III (14 Marks)

7. Draw the spectral reflectance curve of vegetation and explain the key factors responsible for its characteristic peaks and dips across different wavelengths?
8. Explain the applications of shortwave infrared composite images.
9. What elements of image interpretation would you consider differentiating between (i) evergreen and mangrove vegetation (ii) forest from agriculture and plantations.
10. You are assigned to extract water bodies of Hyderabad city using indices. Which index would you choose and why?
11. What is the basic difference between k-means and ISODATA classification approaches?
12. Based on what was discussed in the class, write briefly how you will approach a study on the changes in the spatial extent of city or urban area?
13. Differentiate between FOV and IFOV, what do they refer to in relation to satellite data?

Section: IV (6 Marks)

14. A particular image has been modified by (i) linear contrast enhancement and (ii) by histogram equalisation. Suppose you have available the digital image data for both the original image and the contrast modified versions. By inspecting the data (or histograms) describe how you would determine quantitatively which technique was used in each case.
15. Give a brief account of dimensionality reduction technique discussed in the class that is used in satellite data processing?