Roll No.

ANNA UNIVERSITY (UNIVERSITY DEPARTMENTS)

B.E. /B.Tech / B. Arch (Full Time) - END SEMESTER EXAMINATIONS, NOV/DEC 2023

GEOINFORMATICS

V SEMESTER

GI5502 DIGITAL IMAGE PROCESSING

(Regulation 2019)

Time:3hrs Max.Marks: 100

CO1	Understand about Remote sensing and Image processing systems
CO2	Acquire knowledge about the source of error in satellite image and also to remove the error from satellite image.
CO3	Select appropriate image Enhancement techniques based on image characteristics
CO4	Classify the satellite image using various method and also evaluate the accuracy of classification.
CO5	Apply the advanced image classification methods and conduct lifelong research in the field of image processing.

BL – Bloom's Taxonomy Levels

(L1-Remembering, L2-Understanding, L3-Applying, L4-Analysing, L5-Evaluating, L6-Creating)

PART- A(10x2=20 Marks)
(Answer all Questions)

Q.No	Questions	Marks	CO	BL
1	What is encoding and decoding?	2	1	L1
2	Define Digital Image Processing. How image can be represented?	2	1	L1
3	Write short note on Concept of Sampling and Quantization.	2	2	L2
4	What does IFOV stand for, and why is it important in image processing?	2	2	L2
5	Define Image enhancement. What are the operations used in image enhancement?	2	3	L2
6	Write short note on Morphological and adaptive filters.	2	3	L1
7	Define training sites. List out various methods used to collect it.	2	4	L1
8	What is Baye's theorem?	2	4	L2
9	Write short note on Pavlov experiment.	2	5	L2
10	Differentiate between fuzzy Set and Crisp set.	2	5	L1

PART- B(5x 13=65 Marks)
(Restrict to a maximum of 2 subdivisions)

Q.No	Questions	Marks	CO	BL
11 (a) (i)	Explain in detail about different formats used to store the satellite images	8	1	L4
(ii)	Explain various factors to be considered while selecting hardware and software for image processing.	5	1	L4
	OR			
11 (b) (i)	Explain in detail about the working principles and characteristics of Landsat 5 satellite and its payload with neat sketch.	9	1	L4
(ii)	Discuss briefly about various satellite data products.	4	1	L4
12 (a) (i)	Discuss briefly about different sources of geometric and radiometric errors.	4	2	L4
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(ii)	Explain in detail about various steps involved in the geometric correction of the satellite images.	9	2	L4
	OR			
12 (b) (i)	Describe in detail with neat sketch how different atmospheric attenuation error in the satellite image can be corrected.	10	2	L4
(ii)	Discuss briefly about "sensor model"?	3	2	L4
13 (a) (i)	Explain different Multi image manipulation techniques used to enhance the satellite image.	10	3	L3
(ii)	What is Wavelet transform? Explain its role in image processing	3	3	L3
	OR			
13 (b) (i)	Discuss in detail about contrast manipulation and spatial feature manipulation image enhancement techniques..	13	3	L3
14 (a) (i)	What is supervised classification? Discuss various methods of supervised classification in detail.	8	4	L3
(ii)	What is the role of a Support Vector Machine (SVM) in remote sensing data classification?	5	4	L3
	OR			
14 (b) (i)	What is Unsupervised classification? Explain various unsupervised classification methods in detail.	13	4	L3
15 (a) (i)	What is ADALINE network? Discuss various steps of calculating the optimal weight (w^*)	8	5	L4
(ii)	Discuss how the sub-pixel classification is carried out in detail.	5	5	L4
	OR			
15 (b) (i)	Discuss in detail about various steps involved in Fuzzy logic to classify the satellite image.	9	5	L4
(ii)	Briefly describe about object based classifier.	4	5	L4

PART- C(1x 15=15 Marks)
(Q.No.16 is compulsory)

Q.No	Questions	Marks	CO	BL
16. (i)	Describe in detail about various process involved in BPN to classify the satellite image with neat sketch.	8	5	L5
(ii)	What is accuracy assessment? Discuss it in detail.	7	4	L6