

2022

M.Sc.

2nd Semester Examination
REMOTE SENSING AND GIS
PAPER—RSG-201

Full Marks : 50

Time : 2 Hours

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

RSG-201.1 DIGITAL IMAGE PROCESSING

Group—A

Answer any *two* questions. 2×2

1. Why are edge enhancement techniques needed for digital image processing ?

(Turn Over)

2. What is Gray Level Thresholding?
3. What are the disadvantages of digital image processing?
4. Why have connection of DN is necessary for calculating NDVI?

Group - B

Answer any *two* questions.

2×4

5. Illustrate the concept of Low-pass, High-pass, Bartlett and Butterworth filtering operations in frequency domain with suitable examples.
6. Briefly explain the different types of resampling techniques with a suitable sketch.
7. Give a short account on the "Univariate and Multivariate Image Statistics" citing examples.

8. Critically examine the application of principal component analysis in digital image processing techniques.

Group - C

Answer any *one* question. 1×8

9. What are the applications of spatial filtering techniques? Briefly discuss different types of filters which can be used for restoration of an image in the presence of noise in spatial filtering with a suitable sketch. 2+6
10. Explain the importance of the image restoration and reduction processes in digital image processing. Discuss briefly the significance of the role and different methods of Radiometric Correction? 2+6

RSG-201.2
INFORMATION EXTRACTION FROM SATELLITE IMAGES

Group - A

Answer any *two* questions. 2×2

1. Image Space and Feature Space.
2. Advantages of Mahalanobis distance over Euclidian distance in classification.
3. Sources of errors in classification.
4. Significance of diagonal elements in an error matrix.

Group - B

Answer any *two* questions. 2×4

5. What are the different sampling strategies normally followed for collection of ground truths required for post classification accuracy assessment?

6. What are the short falls of Overall, User and Producer accuracies?
7. Explain decision tree classifiers with proper illustration.
8. How ISODATA differs from k-Mean clustering algorithm? Compare their pros and cons.

Group - C

Answer any one question.

1×8

9. Make a comparative study on Parallelepiped, Minimum distance to mean, Maximum likelihood and k-Nearest Neighbour classifier methods.
10. Table below is an error Matrix Resulting from Classifying Training Set Pixels. You are required to calculate — (a) Overall Accuracy, (b) User's Accuracy, (c) Producer's Accuracy and (d) Kappa Statics ($K - \hat{K}$).

		Class Types Determined from Reference Source				
Class Types Determined from Classified Map	Classes	Settlement	Soil	Wetland	Forest	Water
	Settlement	70	5	0	13	0
	Soil	3	55	0	0	0
	Wetland	0	0	99	0	0
	Forest	0	0	4	37	0
	Water	0	0	0	0	121

[Internal assessment - 10]