

2019

MSc RS & GIS

2nd Semester Examination

MSc (RS & GIS)

PAPER – RSG - 201

Full Marks: 40

Time: 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their

Own words as far as practicable.

Illustrate the answers wherever necessary.

DIGITAL IMAGE PROCESSING

ANSWER ANY 2 (TWO) QUESTIONS OUT OF FOUR QUESTIONS CARRYING 02 MARKS EACH.

- 1) What effect would you expect when all elements of a Kernel / Mask are equal to 1 for convolution procedure?

Will it work as Low – pass or high – pass filter?

- 2) What would be the effect, if the following function is applied on an image?
Name the filter.

$f_{out}(x,y) = \Lambda * f(x,y) + \nabla^2(X, Y)$; where, Λ =Constant; $f(x, y)$ = Original Image;
 $\nabla^2(x, y)$ = Laplacian Filter with +ve Center Coefficient.

- 3) What are the non – systematic geometric errors encountered in a digital remote sensing data?

- 4) What do you mean by “image reduction” and “image magnification”?

Answer any 2 (Two) questions out of four questions carrying 04 marks each.

- 5) Compare effects of 'Max-Min' linear contrast stretches and 'Histogram Equalization' on an image.
- 6) Suppose you have observed following DN values of different bands of Landsat-TM over a dark object.

Band 1	Band 2	Band 3	Band 4
85	41	29	8

Is this a normal trend of DN values for above mentioned bands over a dark object? If not, why? What corrections will you apply to get expected normal DN values for those bands?

- 7) Discuss about PCA Transformation.
- 8) Discuss about spatial and spectral resolution.

. Answer any 1 (one) question out of two questions carrying 08 marks each. (8)

- 9) Write a note on Histogram Equalization explaining its working principle, computation steps, advantages and disadvantages.
- 10) a) Explain multi-spectral classification.
 b) What are the basic types of "pattern recognition"?
 c) Discuss the merits and demerits of visual and computer based classification techniques in Land cover analysis.

2+1+5=8

INFORMATION EXTRACTION FROM SATELLITE IMAGES**ANSWER ANY 2(TWO) QUESTIONS OUT OF FOUR QUESTIONS CARRYING 02 MARKS EACH**

Write brief note on

2x2=4

- 01) Parametric and non-parametric classification.
- 02) Sources of errors in classification.
- 03) Spatial pattern and spectral pattern recognition – write short notes.
- 04) Temporal pattern recognition – Describe.

INFORMATION EXTRACTION FROM SATELLITE IMAGES

Answer any 2 (two) questions out of four questions carrying 4 marks each

4x2=8

- 5) Explain ISO data classification method.
- 6) What are short falls of overall, user and producer accuracies?
- 7) 20, 24, 36, 42, 28, 98, 76, 38, 26, 44, 64, 18, 24, 48, 38 – classify these DN values into 3 classes using K – mean method.
- 8) Explain the minimum distance to mean classifier, and solve the given problem.
The means DN values of soil, vegetation and water body in red band are 30, 60, 10. and in NIR band are 40, 120, 5. Classify the unknown pixels having DN values- (40, 50), (70, 26), (20, 18,), (26, 16,). [first value is red band, second value is NIR band]

Answer any 1 (one) question out of four questions carrying 08 marks each

9) Where should we go for sampling for ground truthing?

Discuss different sampling design with proper illustrations

What is Kappa Statistics Khat (\hat{K}) and its significance?

10) Write a short note on hybrid classification.

Among which classes misclassification occurs and why? –

Built – up area, cropland, follow land, forest (dense), forest (open),

Grass land, moist land, Sand, wet land and water body.

Create a decision tree using the following data:-

CLASS	Mean of Red Band	Mean of NIR Band
Built UP	30	20
Crop land	16	80
Forest	20	60
Sand	60	90
Water body	24	10