

MA/ M.Sc. GEOGRAPHY  
FOURTH SEMESTER  
DIGITAL IMAGE PROCESSING  
MGE – 401A  
[USE OMR FOR OBJECTIVE PART]

**SET  
A**

Duration: 3 hrs.

Full Marks: 70

Time: 30 min.

( Objective )

Marks: 20

*Choose the correct answer from the following:*

**1X20=20**

- Which of the following is an example of Digital Image Processing?
  - Computer Graphics
  - Camera Mechanism
  - Pixels
  - All of the mentioned
- Which of the following is NOT a key consideration when designing image processing systems?
  - Hardware capabilities
  - User preferences
  - Software requirements
  - Processing speed
- What does the term 'histogram' represent in the context of digital image processing?
  - The arrangement of pixels in an image file format
  - The process of converting digital images to visual form
  - A graphical representation of pixel intensity distribution
  - A lookup table used for image transformation
- What is the primary function of a look-up table (LUT) in image processing?
  - To store image metadata
  - To speed up image processing
  - To enhance image resolution
  - To transform pixel values
- Digital images are displayed as a discrete set of \_\_\_\_\_.
  - Intensities
  - Frequencies
  - Resolution
  - Values
- For a continuous image  $f(x, y)$  sampling is defined as:
  - Digitizing the coordinate values
  - All of the mentioned
  - Digitizing the amplitude values
  - None of the mentioned
- Pick that step which deals with tools for extracting image components, those are useful in the representation and description of shape:
  - Segmentation
  - Enhancement
  - Representation & Description
  - Morphological Processing
- How many bits are required in True Color Image to represent all colors:
  - 8-bit
  - 24-bit
  - 16-bit
  - 32-bit

9. What is the spatial resolution of Landsat 9?
  - a. 15 m.
  - b. 30 m.
  - c. 5.8 m.
  - d. 23 m.
10. NDVI value ranges from
  - a. -1 to +1
  - b. -.1 to +.1
  - c. -1 to 0
  - d. 0 to 1
11. What is the full form of LISS?
  - a. Linear Imaging and Self Scanning Sensor
  - b. Linear Imaging Self Scanner
  - c. Line Image Self Scanner
  - d. Linear Imaging Self System
12. For the Calculation of NDVI which band is required?
  - a. Red
  - b. Green
  - c. Blue
  - d. Gamma
13. Which of following is element of visual interpretation ?
  - a. Contrast stretch
  - b. Texture
  - c. Density slicing
  - d. None of the above
14. In False Colour Composite Image , Dense Vegetation is shown as
  - a. Green colour
  - b. Red colour
  - c. Gray colour
  - d. Black Colour
15. Which of the following data can be used as reference data for accuracy assessment?
  - a. UAV data
  - b. GPS data
  - c. Geotagged photograph
  - d. All of above
16. The statistical process of accuracy assessment is known as \_\_\_\_
  - a. Error matrix
  - b. Confusion matrix
  - c. Kappa matrix
  - d. Both a & b
17. In accuracy assessment, Observed Value is equal to \_\_\_\_\_
  - a.  $\frac{\text{Incorrect column total} / \text{Column total}}{100}$
  - b.  $\frac{\text{Diagonal class value} / \text{Column total}}{100}$
  - c.  $\frac{\text{Diagonal class value} / \text{Row total}}{100}$
  - d. overall accuracy
18. \_\_\_\_\_ can be used as reference data
  - a. high resolution satellite image
  - b. aerial photograph
  - c. inventory data
  - d. All of above
19. Kappa co-efficient is also known as
  - a. Kappa statistics
  - b. KHAT index
  - c. Cohen's co-efficient
  - d. All of above
20. Which type of accuracy can be calculated from error matrix table?
  - a. User's accuracy
  - b. Producer's accuracy
  - c. Overall accuracy
  - d. All of above

**( Descriptive )**

Time : 2 hrs. 30 mins.

Marks : 50

*[ Answer question no.1 & any four (4) from the rest ]*

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| 1. What is digital image processing? Explain the fundamental steps in digital image processing.  | 2+8=10       |
| 2. Explain the differences between an analog image and a digital image also discuss the differences between digital images formats and their implications in image processing. | 3+7=10       |
| 3. Write short notes:<br>a. Application of image histograms in digital image processing<br>b. Role of Look-Up Table (LUT) in image enhancement.                                | 5+5=10       |
| 4. What do you understand about image enhancement technique? and Write about spatial and frequency domain methods  | 3+7=10       |
| 5. Describe the elements of image analysis.  | 10           |
| 6. What is image classification? Discuss about supervised and unsupervised image classification method in remote sensing.  | 2+8=10       |
| 7. What is accuracy assessment? Why is it necessary to perform? Discuss the overall process of computation of error matrix.  | 2+2+6<br>=10 |
| 8. Write short note ( <i>any two</i> )<br>a. kappa coefficient<br>b. commission error<br>c. Ground truth collection and its uses   | 5+5 = 10     |

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