

MA/ M.Sc. GEOGRAPHY
FOURTH SEMESTER
DIGITAL IMAGE PROCESSING
MGE – 401A [SPECIAL REPEAT]
[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. $(\text{Incorrect column total} / \text{Column total}) \times 100$
 - b. $(\text{Diagonal class value} / \text{Column total}) \times 100$
 - c. $(\text{Diagonal class value} / \text{Row total}) \times 100$
 - 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]

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: 5+5=10
 - a. Application of image histograms in digital image processing
 - b. Role of Look-Up Table (LUT) in image enhancement.
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
=10
8. Write short note (*any two*) 5+5 = 10
 - a. kappa coefficient
 - b. commission error
 - c. Ground truth collection and its uses

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