KATHMANDU UNIVERSITY
End Semester Examination
July/August, 2024

Level : B.E.
Year : III
Time : 2 hrs. 30mins.

19 AUG 2024

Course : CIEG 302
Semester : I
F. M. : 40

SECTION "B"
[40 marks]

Attempt *ALL* questions.

1. a. Define Projection. Explain the importance of Projection in GIS. [1+4]
   b. Describe the concept of "Buffer" in GIS. [5]

2. a. What is a Digital Elevation Model (DEM)? Explain its usefulness in Hydrologic Modelling in GIS. [1+4]
   b. Explain the difference between Supervised and Unsupervised classification with suitable examples. [5]

3. a. Discuss the importance of metadata in Remote Sensing and GIS. What information is typically included in metadata and why is it essential. [1+4]
   b. Explain the process of data acquisition in Remote Sensing. What are the different platforms used and how do they affect the data collected? [2+3]

4. a. Explain the concept of Spectral signature in Remote Sensing. How are they used to identify and differentiate between various land cover types? [1+4]
   b. Write short notes on [2 × 2.5 = 5]
      i. Electro-magnetic radiation (EMR)
      ii. Atmospheric Window

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F. M. : 10

Registration No.:

Date : 18 AUG 2024

SECTION "A"
[20 Q. × 0.5 = 10 marks]

Choose and encircle in the most appropriate option from each set of choices

1. What is the process of extracting information from imagery called?
   a. Image interpretation b. Georeferencing
   c. Ground truth d. Digital Image Processing

2. Which of the following is not a spatial data type?
   a. Raster b. Vector c. Attribute d. TIN

3. GIS can help to _____ the different driving factors in case of hazard analysis?
   a. Process b. Store c. Integrate d. Visualize

4. Remote Sensing process is based on
   a. Convection b. Conduction c. Reflection of light d. Radiation

5. Which remote sensing data is commonly used for creating digital elevation models (DEMs)?
   a. Radar b. LiDAR c. Thermal infrared d. Multispectral

6. Which of the following is not an electromagnetic wave?
   a. Radio waves b. Microwaves c. Infrared d. Sound waves

7. What is the spatial resolution of a remote sensing image?
   a. The accuracy of the spectral information
   b. The size of the smallest ground area represented by a pixel
   c. The frequency at which the image is acquired
   d. The ability to distinguished between different materials

8. Radiometric error in an image is introduced due to _____
   a. The brightness of the image b. The curvature of the earth
   c. Emission from the surface d. Sensor properties

9. A GIS consists of hardware, software, data and:
   a. GPS b. Maps c. People d. Models

10. What is the process of converting real-world coordinates into a digital format called?
    a. Geocoding b. Projection c. Digitization d. Georeferencing

11. The logarithmic Contrast Stretching is mostly used for _____
    a. Brighter parts of images
    b. Darker parts of images
    c. The higher difference in grey levels
    d. The lower difference in grey levels

12. What is the term used to describe the accuracy of spatial data?
    a. Precision
    b. Resolution
    c. Accuracy
    d. Scale

13. The process of converting an analog signal to a digital signal is called:
    a. Sampling
    b. Quantization
    c. Digitization
    d. Resampling

14. What is the main advantage of active remote sensing over passive remote sensing?
    a. High spatial resolution
    b. Ability to operate at night
    c. Better spectral resolution
    d. Less affected by atmospheric conditions

15. The orbit of a polar satellite is
    a. Elliptical
    b. Spherical
    c. Helical
    d. Circular

16. Which satellite sensor is primarily used for weather observation?
    a. MODIS
    b. AVHRR
    c. GOES
    d. IKONOS

17. What is the main purpose of radiometric correction in remote sensing?
    a. To correct geometric distortions
    b. To enhance spatial resolution.
    c. To convert analog signals to digital signals
    d. To correct sensor noise and atmospheric effects.

18. In GIS, what does 'Topology' refers to?
    a. The color scheme of a map
    b. The geometric properties that do not change under transformations
    c. The attribute data of a map feature
    d. The spatial resolution of a map

19. Pick up the correct statement from the following
    a. An increase of phytoplankton increases the backscattering in the green region
    b. An increase of phytoplankton absorbs the blue region rapidly
    c. Phytoplankton contains photo-synthetically active pigment
    d. An increase of phytoplankton decreases the backscattering in the green region

20. In GIS, what does "attribute data" refer to?
    a. The physical location of a feature
    b. The characteristics or information about a feature
    c. The geometric shape of a feature
    d. The color of a feature on a map