KATHMANDU UNIVERSITY
End Semester Examination [C]
December, 2024

Marks Scored:

Level : B.E.
Year : III

Course : CIEG 302
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date : 24 DEC 2024

SECTION "A"
[20 Q. × 0.5 = 10 marks]

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

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

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

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

4. 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

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

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

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

8. DEM is necessary for studying which of the following
   a. Watershed Management b. Soil Moisture Estimation
   c. Ground Water Analysis d. Land Cover Changes

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

10. Environmental GIS describes the use of
    a. Location-based data management tools to assist in the decision-making processes
    b. Data on atmospheric absorption of radiation
    c. Electromagnetic energy in very specific regions
    d. Electromagnetic energy in wide regions

11. How do agricultural lands appear in an image displayed in standard FCC?
    a. Blue b. Yellow c. Red d. Green

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

13. The differences of a certain tone throughout an aerial image refers to
    a. Pattern b. Size c. Association d. Texture

14. A sensor's ability to determine fine differences in a band of energy measurements is a sensor's
    a. Radiometric resolution b. Spectral resolution
    c. Spatial resolution d. Temporal resolution

15. Vector data _____
    a. Consume large storage space b. Depict various themes
    c. Are continuous d. Are discrete

16. The key of interpretation which gives an idea of the profile and relative height of an object
    a. shadow b. shape c. tone d. pattern

17. Which among these governs the relationship between various vector features in a map?
    a. Map scale b. Pixel size c. Topology d. Map Coordinates

18. Which is the first fundamental step in image processing?
    a. Image acquisition b. Filtration
    c. Image enhancement d. Image restoration

19. Which type of scattering will be more prominent in a polluted environment?
    a. Rayleigh Scattering b. Mie Scattering
    c. Non-Selective Scattering d. Raman Scattering

20. The spectral range of NIR region in the EMS is
    a. 700 ~ 900 nm b. 700 ~ 1250 nm c. 700 ~ 1500 nm d. 700 ~ 2000 nm

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SECTION "B"
[40 marks]

Attempt *ALL* questions.

1.
   a. Discuss on the Spectral Reflectance Characteristics of water and vegetation in different spectral bands. [2.5+2.5]
   b. Describe the concept of "Buffer" in GIS. [5]

2.
   a. What is a Digital Elevation Model (DEM)? How can we generate catchment area using DEM? Explain in detail. [1+4]
   b. How Unsupervised classification can be used in Remote Sensing? Describe. [5]

3.
   a. What is Georeferencing? Explain its importance in GIS. [1+4]
   b. What is colour composite? Enumerate the use of various colour composite in Remote Sensing and GIS. [2+3]

4.
   a. Define digital image processing. Also differentiate between Visual and Digital interpretation procedure. [2+3]
   b. Write short notes on [2×2.5]
      i. Electro-magnetic radiation (EMR)
      ii. Geographic Coordinate System