Marks scored:

KATHMANDU UNIVERSITY
End Semester Examination [C]
November, 2018

Level : B.E.
Year : IV

Course : GEOM 402
Semester: I

Exam Roll No. :

Time: 30 mins.

F. M. : 10

Registration No.:

Date NOV 16 2018

SECTION "A"
[20 Q.× 0.5 =10 marks]

Tick the most appropriate answer.

1. Which of the following measurement of electromagnetic radiation is not important for the remote sensing system?
   a. Reflected Electromagnetic radiation
   b. Reradiated electromagnetic radiation
   c. Emitted electromagnetic radiation
   d. Transmitted electromagnetic radiation

2. Select the most correct answer form the following statement
   a. The amount of electromagnetic radiation an object emits partially depends on its temperature
   b. The higher the temperature of an object, the longer its peak wavelength of emitted radiation
   c. The total energy emitted from an object varies as fourth power of temperature
   d. The lower the temperature of an object, the shorter its peak wavelength of emitted radiation

3. In which range of electromagnetic spectrum does the earth emits its highest amount of electromagnetic radiation?
   a. Visible range
   b. Optical range
   c. Thermal infrared range
   d. Microwave range

4. The area of the spectrum which are not severely influenced by atmospheric absorption and thus, are useful to remote sensors, are called
   a. Atmospheric windows
   b. Electromagnetic spectrum
   c. Electromagnetic radiation
   d. Polarization

5. The ability of a sensor to identify the smallest size details of pattern on an image is called
   a. Spatial resolution
   b. Spectral resolution
   c. Radiometric resolution
   d. Temporal resolution

6. Which of the following type of remote sensing system used whiskbroom scanner?
   a. MODIS  b. Landsat TM  c. AVHRR  d. SPOT

7. The Digital number (DN) range of the 8-bit image is
   a. [0, 63]  b. [0, 64]  c. [ 0, 255]  d. [0, 256]

8. Which of the following image format is suitable if one is mainly interested in working with individual spectral bands?
   a. Band Sequential (BSQ)
   b. Band Interleaved by Sample (BIS)
   c. Band Interleaved by Line (BIL)
   d. Band Interleaved by Pixel (BIP)

9. If the minimum and maximum DN value of a scene of 8-bit image is 20 and 120 respectively. The image is subjected to the min-max linear stretch, then what is the DN value of the pixel whose original DN value is 70?
   a. 128 b. 70 c. 90 d. 150

10. The formula for derivation of Normalized difference Vegetation Index (NDVI) is
   a. $\frac{NIR-Green}{NIR+Green}$ b. $\frac{NIR+Green}{NIR-Green}$ c. $\frac{NIR-Red}{NIR+Red}$ d. $\frac{NIR+Red}{NIR-Red}$

11. Noise reduction in the image can be done by using
   a. High pass filter b. Low pass filter
   c. Edge detection filter d. Gradient filter

12. Dark object subtraction method relies on the assumption that
   a. The atmospheric effect is represented by lowest DN values
   b. Two objects with zero reflectance and highest reflectance are able to correct atmospheric effect
   c. Radiative transfer codes are best method for atmospheric correction
   d. Conversion of signal into digital number is done in atmospheric correction

13. Which of the following interpolation techniques produces most smooth image result?
   a. Nearest Neighbor b. Bilinear interpolation
   c. Cubic Convolution d. Polynomial interpolation

14. RADAR is
   a. Non-imaging microwave remote sensing
   b. Imaging microwave remote sensing
   c. Non-imaging radio wave remote sensing
   d. Imaging radio wave remote sensing

15. Cloud appears white to our eyes due to
   a. Rayleigh scattering b. Mie scattering
   c. Non-selective scattering d. Diffuse scattering

16. Which if the following satellite is not a geo-stationary satellite?
   a. Weather b. Telecommunication
   c. Television d. Earth Monitoring

17. A minimum distance classification approach uses
   a. Highest probability of a pixel falling into each class
   b. Mean and median values to assign class
   c. Minimum and maximum value to assign class
   d. Least standard deviation to assign class

18. Lunch of Landst-1 was done in
   a. 1970 b. 1972 c. 1978 d. 1986

19. The sum of the weight of the following filter is zero
   a. High pass b. Low pass c. High boost d. Band pass

20. Which of the following is no the image interpretation element?
   a. Tone b. Shadow c. Pixel size d. Context

KATHMANDU UNIVERSITY
End Semester Examination [C]
November, 2018



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

Course : GEOM 402
Semester: I
F. M. : 40

SECTION "B"
[8Q ×5 = 40 marks]

Attempt *ANY EIGHT* questions.

1. Why remote sensing is demanding field for present context? In which principle remote sensing system is guided by? [3+2]

2. What are the major differences between exitance, irradiance and radiance?

3. Differentiate between Whiskbroom and Pushbroom scanner.

4. Most of the image acquired till now is captured through passive remote sensing approach. Briefly explain the radiation components involved in the acquiring image using passive remote sensing system.

5. Suppose you are asked to design a remote sensing system with a GIFOV of 1 m, an altitude of 700 km, and a focal length of 10 m. What is the required detector element size? If the sensor is 1-D array pushbroom and has 4000 detectors, what are its FOV and GFOV, assuming flat earth? [3+2]

6. What do you mean by linear filter? List out the different types of linear filter. Briefly explain any one of them. [1+2+2]

7. Define Geocoding. List the types of interpolation method. Discuss any one of them. [1+2+2]

8. List the different algorithm used for supervised classification. Explain any one of them. Which of them is most effective and why? [2+2+1]

9. Write short notes: (*ANY TWO)* [2.5+2.5]

   a. Minimum Mapping Unit (MMU)
   b. Histogram Equalization
   c. Synthetic Aperture Radar (SAR)
   d. Signal Noise Ratio (SNR)