

### SET 3\_GI\_Engineering

1. If  $P = \begin{bmatrix} 2 & -1 \\ 2 & 3 \end{bmatrix}$  and  $Q = \begin{bmatrix} 3 & 4 \\ 3 & 5 \end{bmatrix}$ , then the transpose of the product  $PQ$  is equal to

A.  $\begin{bmatrix} 3 & 3 \\ 15 & 23 \end{bmatrix}$

B.  $\begin{bmatrix} 14 & 9 \\ 16 & 12 \end{bmatrix}$

C.  $\begin{bmatrix} 3 & 3 \\ 23 & 15 \end{bmatrix}$

D.  $\begin{bmatrix} 3 & 15 \\ 3 & 23 \end{bmatrix}$

2. The rank of matrix  $A = \begin{bmatrix} 2 & -1 & 3 & 1 \\ 1 & 4 & -2 & 1 \\ 5 & 2 & 4 & 3 \end{bmatrix}$  is:

A. 1

B. 2

C. 3

D. 0

3. If the matrix  $A = \begin{bmatrix} 1 & -2 & 0 \\ 1 & 1 & 1 \\ 0 & 2 & 1 \end{bmatrix}$  is expressed as a sum of a symmetric matrix ( $P$ ) and a skew symmetric matrix ( $Q$ ), then  $P$  is given by

A.  $\frac{1}{2} \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -3 \\ 0 & -3 & 2 \end{bmatrix}$

B.  $\frac{1}{2} \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -3 \\ 0 & 3 & 2 \end{bmatrix}$

C.  $\begin{bmatrix} 1 & -1/2 & 0 \\ -1/2 & 1 & 3/2 \\ 0 & 3/2 & 1 \end{bmatrix}$

D.  $\begin{bmatrix} 1 & 1/2 & 0 \\ 1/2 & 1 & 3/2 \\ 0 & 3/2 & 1 \end{bmatrix}$

4. If 1, 1/2 and 1/4 are the eigenvalues of a matrix  $A$ , then the eigenvalues of the matrix  $4A^2$  are:

A. 4, 1, 1/4

B. 4, 1/2, 1/4

C. 4, 1, 1

D. 4, 2, 1

5. The system of equations:  $2x + y + 4z = 2$ ,  $x + 2y - z = 3$  and  $x + y + z = 4$  has

A. a unique solution

B. no solution

C. exactly two solutions

D. infinite number of solutions







26. Which of the following resolution corresponds to capture of the smallest difference in reflectance by the ground object?
- A. Radiometric Resolution                      B. Temporal Resolution  
C. Spatial Resolution                              D. Spectral Resolution
27. Which of the following type of data will have highest spectral resolution and lowest spatial resolution by theory?
- A. Hyperspectral Images                          B. Microwave Images  
C. Multispectral images                              D. Pan Images
28. Multispectral images can be displayed in which of the following color forms?
- A. HIS Model    B. RGB Model  
C. False Color                                        D. All of the above
29. Atmospheric windows in remote sensing are \_\_\_\_\_.
- A. EM Wavelengths which can pass through Atmosphere  
B. Physical gaps in atmosphere  
C. Reflectance by atmosphere  
D. None of the above
30. Which of the following type of resolution is not found in SAR images?
- A. Temporal Resolution                              B. Range Resolution  
C. Azimuth resolution                                D. Spectral Resolution
31. How many minimum numbers of satellite will always be available in the GPS constellation?
- A. 4    B. 32  
C. 28    D. 24
32. The Atmospheric error in the GNSS measurement can be removed by?
- A. Atmospheric correction                        B. Differential GNSS measurements  
C. Point Positioning                                D. None of the above

33. The default datum used in the GNSS system is:
- A. NAD 27
  - B. NAD 83
  - C. WGS84
  - D. Everest
34. The GNSS is commonly used for providing coordinated around the globe it is also used to give accurate \_\_\_\_\_.
- A. Weather information
  - B. Disaster Information
  - C. Time
  - D. Datum Information
35. The presence of high-rise buildings can give which errors in GNSS measurements?
- A. Multi-path Effect
  - B. Atmospheric Effect
  - C. Clock error
  - D. Receiver Error
36. Information about any data is known as \_\_\_\_\_.
- A. Raster Data
  - B. Vector data
  - C. Metadata
  - D. None of these
37. To fill the data gap, we can use which of the following method?
- A. Image enhancement
  - B. Image Filtering
  - C. Interpolation
  - D. Image transformation
38. Which of the following is example of nontopological data format?
- A. Shapefile
  - B. DFX
  - C. TIGER
  - D. None of these
39. Example of a composite feature model is?
- A. TIN
  - B. Route Data Model
  - C. Raster Data Model
  - D. Both A & B
40. In TIN model of a mountain (very high slope) the size of the triangles will be comparatively?
- A. Large
  - B. Small
  - C. Very Large
  - D. Very Small

41. The data model which stores the spatial data and attributes data in a single system is called \_\_\_\_\_.

- A. Object based data model
- B. Georelational data model
- C. Raster Data Model
- D. ESRI Coverage Model

42. A geodatabase data model from ESRI, Inc. has how many topology rules?

- A. 10
- B. 50
- C. 26
- D. 25

43. Figure given below shows which error in vector data?



- A. Undershoot
- B. Overshoot
- C. Pseudo node
- D. None of these

44. Which of these GIS packages allow topological based data editing?

- A. ArcGIS
- B. AutoCAD Map
- C. MGE (Base Mapper)
- D. All of these

45. An overlay method that preserves only those features falling within the area extent common to the input layers is known as:

- A. Erase
- B. Clip
- C. Dissolve
- D. Intersect

46. A very small polygon found along the shared boundary of the two input layers in overlay is known as:

- A. Golds
- B. Silvers
- C. Split polygon
- D. Buffer polygon

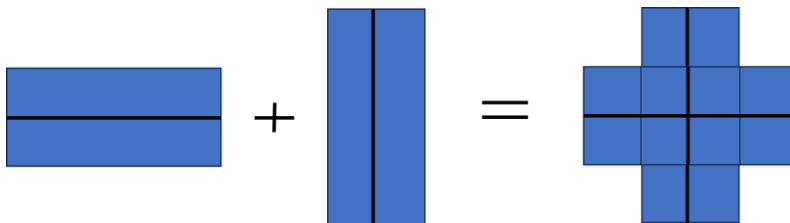
47. A polygon-on-polygon overlay method that preserves all features from the input layers is known as:

- A. Union
- B. Select
- C. Update
- D. None of these

48. Buffer of a point feature will be a

- A. Line feature
- B. Point feature
- C. A polygon feature
- D. Polyline feature

49. The below figure shows which overlay method?



- A. Intersect
- B. Identity
- C. Union
- D. None of these

50. Which of these is the lossless compression method?

- A. RLE
- B. LZW
- C. Tiff
- D. All of these

51. Often to import a DEM image a GIS package need information about the raster such as the data structure, area extent, cell size, number of bands and value for no data. This information is stored in?

- A. Projection file
- B. Spatial data file
- C. Header File
- D. None of these

52. Nonspatial attribute table can be in which format?

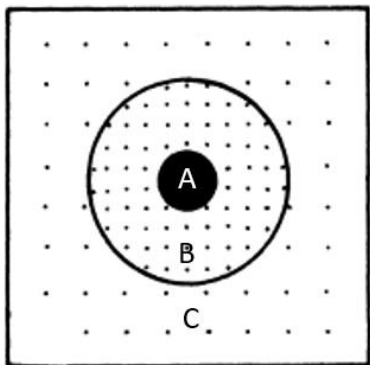
- A. dBASE
- B. Excel file
- C. Delimited text files
- D. All of these







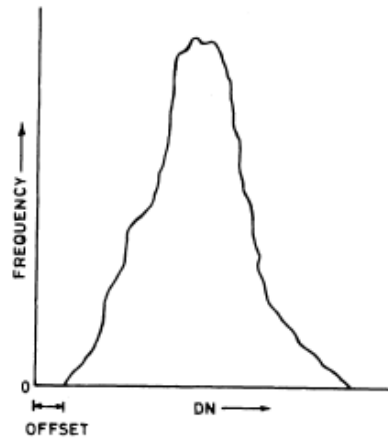
67. Relief Displacement will be highest at which part of the photograph?
- A. At the principal point                      B. 20 cm East of principal point  
 C. 30 cm North of principal point        D. 80 cm West of principal point
68. Apparent change in the relative position of a stationary object in a single photograph is due to?
- A. Parallax                                      B. Relief displacement  
 C. Photogrammetry                          D. None of the above
69. The DEM which captures the features such as trees and buildings are known as \_\_\_\_\_.
- A. Digital Surface model                      B. Digital Terrain Model  
 C. Digital Twins                                D. None of these
70. To create a DEM, we will need which of the following survey coordinates?
- A. X & Y    B. X, Y & Z  
 C. Y & Z    D. Z
71. The filter that if applied to an urban area UAV image (RGB) which is a heterogeneous, high-frequency urban environment the image will get blurred. Which filter will this be?
- A. High-Pass Filter                              B. Low-Pass Filter  
 C. Medium Filter                                D. Minimum Filter
72. In the figure below region A, B & C represents frequency components in the amplitude spectrum. Region 'B' represents which frequency.



- A. High Frequency                              B. Low Frequency  
 C. Mid Frequency                                D. Very High Frequency



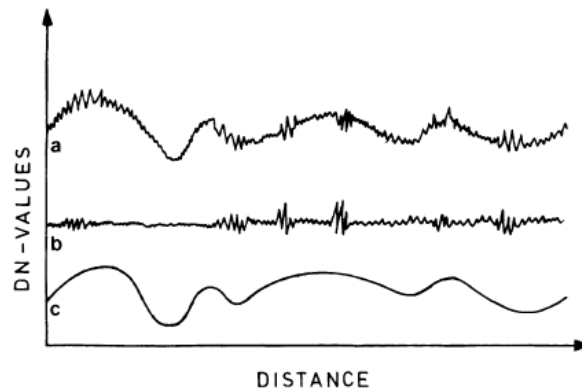
78. Regression models describe the relationship between variables by fitting a line to the observed data. In general, which regression uses a straight line?
- A. Logistic regression models                      B. Linear regression models  
 C. Nonlinear regression models                  D. None of these
79. Below is the NIR image histogram containing water, forest and land areas, it shows the offset in the DN values toward higher DN values due to which of the following?



- A. Atmospheric contribution                      B. Geometric Error in the image  
 C. Display error of image                        D. None of these
80. Scattergram in remote sensing is the plot between DN values of \_\_\_\_\_.
- A. Two band of the image  
 B. One Band of the image  
 C. One Bands of image and its frequency  
 D. All of the above
81. A technique for resampling raster image in which the value of each cell in an output image is calculated using the value of the nearest cell in an input image is known as.
- A. Bilinear Interpolation                          B. Cubic Convolution  
 C. Interpolation                                    D. Nearest Neighbor
82. Pitch, roll and yaw of platform causes which type of geometric distortion in the images?
- A. Systematic Distortion                        B. Non-Systematic Distortion  
 C. Panoramic Distortion                         D. None of the above



89. Below figure represents low-frequency and high-frequency components in an image. (a) is a typical profile of DN values consists of a complex combination of sine waveforms which can be split into low-frequency components and high-frequency profiles. Now in the given figure (c) represents which type of frequency profile of the image?



- A. High-frequency profile                      B. Low-frequency profile  
 C. No-frequency profile                      D. All of the above
90. The main aim of image smoothing is to improve the image information, in effect, it is just the reverse of edge enhancement. It does that by \_\_\_\_\_ the low-frequency spatial information.
- A. Enhancing                                      B. Suppressing  
 C. Removing                                      D. None of the above
91. For maximum likelihood classification which type of data distribution is most suitable?
- A. Normal data distribution                      B. Bimodal Data Distribution  
 C. Trimodal Data Distribution                      D. None of these
92. Spline, Kriging and Inverse Distance Weighted (IDW) are all methods of-
- A. Image transformation                      B. Image segmentation  
 C. Data Assimilation                              D. Interpolation
93. The correct expression for alteration of values of individual pixels in an image transformation is-
- A.  $s=T(z)$ , where  $z$  is the intensity, and  $T$  is the transformation function  
 B.  $s=T|z|$ , where  $z$  is the intensity, and  $T$  is the transformation function  
 C.  $s=T^2z$ , where  $z$  is the intensity, and  $T$  is the transformation function  
 D.  $s=T^3z$ , where  $z$  is the intensity, and  $T$  is the transformation function

94. Sharp Gray Level transitions can be removed by applying-
- A. Goldstein Filter
  - B. Smoothing Filter
  - C. Lee Sigma Filter
  - D. Modified Goldstein Filter
95. If an image contains no vegetation the NDVI value will be :
- A. Close to 1
  - B. Close to 0
  - C. 0.85
  - D. None of these
96. Image sharpening is done to-
- A. Highlight the minutest details in an image
  - B. Decrease the Image brightness
  - C. Increase the brightness
  - D. Blurring the image
97. True color of the feature is seen in which color model display?
- A. RGB
  - B. HIS
  - C. CMYK
  - D. None of these
98. Purpose of PCA before clustering is-
- A. Find which dimension of the data maximizes the feature variance
  - B. Suppress bad features
  - C. Find good features to improve your clustering score
  - D. Find the explained variance
99. PCA is best suited for-
- A. Image segmentation
  - B. Data fusion
  - C. Data dimensionality reduction
  - D. Image to image co-registration
100. The method best suited for projecting and visualizing data in lower dimensions would be-
- A. KNN
  - B. SVM
  - C. Lasso
  - D. PCA