



## Practice Exam 1 - Geospatial Core Technical Knowledge Exam<sup>R</sup>

The Geospatial Core Technical Knowledge Exam is administered twice each year, and an individual must score at least 75% correct from 100 scored questions administered in order to pass. Exam questions are taken from the Exam Blueprint comprising 44 Knowledge, Skills, & Abilities (KSAs) in 6 Knowledge Categories. The Exam Blueprint is contained in the Exam Candidate Manual, available on the GISCI web site.

This practice exam has been produced to provide 50 sample questions based on most of the KSAs listed. It is intended to aid those preparing to take the exam by giving an individual an opportunity to determine her/his knowledge of the areas tested. GISCI offers no statement, expressed or implied, that being able to pass this practice exam determines an individual's readiness to test and pass. That responsibility for adequate preparation remains with the individual. The questions below are not official exam questions and have been prepared for general educational purposes to demonstrate the types of questions and the format that an individual may see on the exam.

We recommend setting aside a block of time to go through this practice exam, answering each question without referring to the answer key. After answering each question and determining an overall score, continue your evaluation by looking closely at your performance, specifically in each KSA and in the Knowledge Categories, overall, to understand your strengths and weaknesses, and use that information to set priorities for further study and review. Remember that study should be focused and directed to the KSAs shown.

Exam questions are in the format of multiple choice, requiring one best answer among the choices provided, and multiple response, requiring multiple answers from the choices provided. Each question has a sequence number and a KSA number associated with it, located within each Knowledge Content Area.

***While passing the practice exam cannot be taken as a direct indication of ability to pass the exam, not doing well on it should be taken as a strong indication that an individual needs more preparation time before planning to take the Geospatial Core Technical Knowledge Exam<sup>R</sup>.***

### 1. Conceptual Foundations (12 Wt %)

# 1 101 The property of area for a parcel polygon may be considered (Choose the best answer)

- A. Precise
- B. Accurate
- C. Legally correct
- D. Both a and b above

# 2 102 A vector data model uses which of the following coordinate pair types to build curvature within a line?  
(Choose the best answer)

- A. Vertices
- B. Points
- C. Floating Points
- D. Nodes

# 3 103 GIS differs from surveying and mapping by introducing (Choose the best answer)

- A. Attribute descriptions
- B. Spatial analysis
- C. Location determination
- D. Temporal information

# 4 104 What is a datum? (Choose the best answer)

- A. A mathematical model
- B. The mathematical model related to real world features
- C. Real world features projected with minimum distortion from a round earth to flat map.
- D. A system of coordinates.

# 5 105 Which method is used to align an unreferenced dataset with one that has spatial reference information? (Choose the best answer)

- A. Scaling
- B. Reprojecting
- C. Georeferencing
- D. defining projections

# 6 105 Control points are best described as (Choose the best answer)

- A. Areas on the map where projection can easily change
- B. Points on the map that do not have a spatial reference
- C. Points in the data that share the same datum, no matter how the datasets are altered
- D. Common locations used in aligning two datasets

## 2. Cartography & Visualization (14 Wt %)

# 7 206 In a map showing contours, the name of the darker contour lines is (Choose the best answer)

- A. Index contours
- B. Key contours
- C. Lines of deviation
- D. Lines of Elevations

# 8 207 Imaginary lines on a map that represent areas of constant elevation are (Choose the best answer)

- A. Bands
- B. Contours
- C. Digital line graphs
- D. Collars

# 9 208 The inherent ability to suggest pattern in the phenomena they represent is a fundamental use of (Choose the best answer)

- A. Maps
- B. Tables
- C. Layers
- D. Points

# 10 209 If you are making a web map of sampling locations, streams and watershed areas, in what order would you place the layers on the map? (Choose the best answer)

- A. Sampling locations, wetland areas, streams
- B. Streams, wetland areas, sampling locations
- C. Sampling locations, streams, wetland areas
- D. It doesn't matter what order they are in

# 11 210 A small-scale map would show (Choose the best answer)

- A. A larger geographic area than a large-scale map
- B. A smaller geographic area than a large-scale map
- C. The same geographic area as a large-scale map, just at a smaller resolution
- D. The same geographic area as a large-scale map, just at a larger resolution

# 12 211 When mapping sensitive data, what are some techniques that can be used to not reveal details of the data? (Select all that apply).

- A. Show the data as a heat map
- B. Show the data as a point layer
- C. Label the addresses that correspond to the data
- D. Aggregate the data into quantities using graduated colors, symbols or proportional symbols

# 13 211 How does using multiple attributes by category make a map more informative? (Choose the best answer)

- A. It makes the map more colorful
- B. It provides the reader with multiple layers of information that are easily recognizable on the map
- C. It shows a high level of expertise has been obtained by the map creator
- D. Multiple attributes only clutter up a map

### 3. GIS Design Aspects & Data Modeling (29 Wt %)

# 14 312 Which of the following data formats would most likely represent a file exported from AutoDesk-AutoCAD (Choose the best answer)

- A. .SHP
- B. .DXF
- C. .TXT
- D. .LAS

# 15 313 Numerous employees in your organization need access to the streets data that your team is responsible for maintaining in an enterprise database. From the options given below, what is the best way to handle access to these data? (Choose the best answer)

1. Set the streets layer's permissions to allow everyone in your enterprise full control
2. Set the streets layer's permission to allow full control only to your team
3. Set the streets layer's permission to allow full control only to your team and read-only access to the remainder of your enterprise
4. Set up a download site for everyone in your enterprise. Direct access to these data will be restricted to your team only.

# 16 313 A third-party software system is being stored, distributed and maintained by a county agency which provides access based on a fee charged to each local jurisdiction. What would be the safest and most efficient ways to add a new user? (Select all that apply)

- A. Let anyone sign on as a user as long as they notify the county agency afterward
- B. Notify the county agency that you would like to add a user and have them do it
- C. Request that the county agency set up an administrator account for your jurisdiction and allow you to have oversight of your users
- D. Don't allow new users

# 17 313 The local county health department has provided data on EMS calls and ER calls in order for a county GIS department to produce maps showing patterns and density of calls. What restrictions would be involved in using this data? (Choose the best answer)

- A. HIPPA laws
- B. Fire Safety regulations
- C. GIS mapping standards
- D. There are no restrictions

# 18 314 Select from the list below all roles of a database administrator is expected to fill (Select all that apply)

- A. Create database security settings which reflect the needs of the organization
- B. Create queries for reporting purposes
- C. Install and configure server hardware
- D. Backup and Recovery of database

# 19 315 Several characteristics of GIS services that make it difficult to design GIS web services with satisfactory performance. These include (Select all that apply)

- A. GIS requires heavy CPU usage
- B. GIS services sometimes transmit large images
- C. Clients of GIS services are often complex software packages
- D. GIS is not scalable to web services

# 20 316 Leveraging GIS to support an enterprise environment can be best accomplished using which of the following approaches? (Choose the best answer)

- A. Write-protected shapefiles located on each employee's workstation
- B. Geodatabases stored on a centralized server
- C. Geospatial data served as map services and web maps
- D. A well-staffed GIS department that is able to answer all questions required for the enterprise

# 21 318 Which of these types of online information could NOT be referenced in a hyperlink field within a Geographic Information System data table? (Choose the best answer)

- A. Assessment records for parcel polygons
- B. Precipitation data for rain gage points
- C. City name for municipal polygons
- D. Construction project information for roadway lines

- # 22 319 You have been assigned team lead on the development of a new GIS database for a large county. From the options given below, what is the best approach to this project? (Choose the best answer)
- A. You and your team should study the county and develop the database for them based on your expert knowledge of GIS
  - B. You and your team should interview end-users at the county to learn how this enterprise functions and then design a database to satisfy their particular needs
  - C. You and your team should acquire a copy of the county's geospatial data and convert it into the Local Government Information Model (LGIM). Delivery of this end-product will setup the county for their long-term needs
  - D. Both a and c are equally correct.
- # 23 320 Object-relational databases have become the cornerstone of modern GIS. These databases can be best described in which of the following ways: (Choose the best answer)
- A. Each database contains one table and one GIS layer
  - B. The database contains one attribute table for each GIS layer. The attribute table may contain numerous fields (attributes)
  - C. The database will contain many GIS layers, each with an attribute table. The attribute table may contain numerous fields (attributes)
  - D. The database will contain many GIS layers, each with an associated attribute table. In addition, other tables may exist that further describe specific characteristics of the GIS layer and are associated with the GIS layer through a relationship. Each table may contain numerous fields (attributes).
- # 24 321 One common task faced by the GIS professional is the assurance of data quality and correctness. An example of this is ensuring all County polygons fall within the polygon of their respective State. This can be accomplished using which of the following workflows? (Choose the best answer)
- A. Clip the Counties polygon layer with the State polygon layer. Then check if the counties layer changed. If so, it is understood that the Counties layer was larger than the State layer, thus requiring further action.
  - B. Apply a topology rule to the Geodatabase feature dataset containing County and State polygon feature classes and determine if the State feature class is covered by the Counties feature class
  - C. Apply a topology rule to the folder containing County and State shapefiles and determine if the State feature class is covered by the Counties feature class
  - D. Simply sum the area of the Counties layer and State layer. If they agree it is safe to assume they share consistent topology
- # 25 322 When a GIS dataset for a given project is constantly revised, accessed, and manipulated by multiple users the best practice approach for storing the data is (Choose the best answer)
- A. Shapefiles
  - B. Personal Geodatabase
  - C. KML files
  - D. Enterprise Geodatabase
- # 26 323 What technology allows for multiple server instances on a single piece of hardware/single server? (Choose the best answer)
- A. Open Source
  - B. Remote Desktop
  - C. Virtualization
  - D. Network Attached Storage

# 27 324 Which of the following is NOT a true relational database? (Choose the best answer)

- A. SQL Server
- B. Access
- C. Oracle
- D. PostgreSQL

#### 4. GIS Analytical Methods (17 Wt %)

# 28 425 Overlay analysis is based on (Choose the best answer)

- A. Principal component analysis
- B. Spatial diffusion
- C. Graph theory
- D. Boolean logic

# 29 425 What are good reasons to use scale-dependant rendering that changes the source of a dataset to a less detailed and less accurate dataset as the scale of the map is made smaller? (Select all that apply)

- A. To reduce file size of the digital version of a map
- B. To make features appear larger than they are
- C. To reduce cluttered/confusing representations in map products
- D. To encourage the viewer to overlook important details

# 30 426 Representing features logically in GIS format requires knowledge of GIS primitives. The scale at which a feature is intended to be shown can help define the proper primitive used to create and display that feature. The best option to represent a feature class for rivers in a State-wide map would be: (Choose the best answer)

- A. Point Feature
- B. Polygon feature
- C. Line Feature
- D. Multi-patch feature

# 31 428 You have been asked to analyze ground water quality for a largely rural American county. During your analysis you learn that septic tank density has a correlation coefficient of 0.15 with ground water nitrate concentrations. From these data, you can safely infer (Choose the best answer)

- A. Septic tanks appear to contribute to the Counties ground water nitrate concerns. However, additional factors are also involved and need to be investigated.
- B. Septic tanks have increased nitrate concentration by 15%. Therefore, restricting future septic tank installations is important for the counties ground water quality.
- C. Septic tanks have increased nitrate concentration by 15%. Therefore, restricting future septic tank installations is important for the counties ground water quality. In addition, the County needs to seriously consider extending existing sewer lines to thereby reduce the number of septic tanks.
- D. The correlation coefficient of 0.15 is very low and fails to show any correlation between septic tanks and the Counties ground water concerns regarding nitrates.

# 32 429 In the world of programming, the most basic skills utilized are (Select all that apply)

- A. Scripting
- B. Tool Modification
- C. Application Development
- D. Software Engineering

# 33 430 Uniform cell size is a description of (Choose the best answer)

- A. A raster data structure
- B. A vector data structure
- C. A point data structure
- D. A polygon data structure

# 34 431 What are good reasons to use scale-dependant rendering that changes the source of a dataset to a less detailed and less accurate dataset as the scale of the map is made smaller? (Select all that apply)

- A. to reduce file size of the digital version of a map
- B. to make features appear larger than they are
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- D. to encourage the viewer to overlook important details

# 35 432  $\pi/4$ rad =

- A. 90 degrees
- B. 30 degrees
- C. 60 degrees
- D. 45 degrees

### 1. Data Manipulation (15 Wt %)

# 36 533 Showing data based on defined parameters is one of the greatest benefits of GIS. Filtering data based on the specific content stored in a field refers to which of the following: (Choose the best answer)

- A. Attribute query
- B. Spatial query
- C. Locational query
- D. Cartographic query

# 37 534 The shapefile format is a digital vector format for storing geometric locations and associated attribute information. While it can consist of several files with different file name extensions, three file names are needed to be properly identified as a shapefile. These are: (Choose the best answer)

- A. shp, sbn, prj
- B. shp, shx, dbf
- C. shp, sbn, dbf
- D. shp, sbn, sbx

# 38 535 Calculations (sum, average, median, etc.) can't be performed on this type of field  
(Choose the best answer)

- A. Character
- B. Integer
- C. Floating
- D. BLOB

# 39 537 When converting Degrees/Minutes/Seconds of latitude in the Northern Hemisphere to decimal degrees  
(Choose the best answer)

- A. Add the three values together and divide the sum by 3600, i.e.,  $(\text{Deg} + \text{Min} + \text{Sec}) / 3600$
- B. Subtract the seconds from the minutes, then the minutes from the degrees i.e.  $(\text{Deg} - (\text{Min} - \text{Sec}))$
- C. Multiply the Minutes by 60, multiply the seconds by 3600 and then add all to the degrees, i.e.,  $(\text{Deg} + (\text{Min} * 60) + (\text{Sec} * 3600))$
- D. Divide the Seconds by 3600, divide the Minutes by 60, then add those values to the degrees, i.e.  $(\text{Deg} + (\text{Min} / 60) + (\text{Sec} / 3600))$

# 40 537 If converting Degrees/Minutes/Seconds of latitude in the Southern Hemisphere to decimal degrees, what  
would change from question 1? (Choose the best answer)

- A. You would add the derived value to 180
- B. You would subtract the derived value from 180
- C. You would multiply the derived value by -1
- D. You would divide the derived value by -1

# 41 538 To determine the horizontal accuracy of an ortho-rectified aerial image, (Choose the best answer)

- A. The image is compared to a historic photograph and 90% of the well-known points must match,
- B. Photo-identifiable field points are surveyed and the Root-Mean Square error between the image and the Photo-ID points is computed,
- C. Points are heads-up digitized from the ortho-rectified aerial image and compared to points from GIS layers
- D. Have multiple technicians measure football fields end zone to end zone (300 feet) (or other well-known structures) and the standard deviation of those measurements is the accuracy.

#42 538 The most common statistical method to determine the attribute (land classification) accuracy of a raster-derived land use/land cover map is to: (Choose the best answer)

- A. Use photo-identifiable points for ground truthing and compute a RMSe
- B. Have multiple technicians compile vector polygons and then do a Union Overlay. The total area of the sliver polygons is the statistical error
- C. Compute a Confusion Matrix based on ground truthing a stratified random sample of polygons
- D. Compute the variance in the number of polygons of each land use/land cover class

## 6. Geospatial Data (13 Wt %)

# 43 639 The Federal Geographic Data Committee has endorsed (Choose the best answer)

- A. only the Content Standard for Digital Geospatial Metadata (CSDGM)
- B. only the ISO 19115 Geospatial Metadata Standard
- C. only the CSDGM and the ISO 19115 standards
- D. the CSDGM, ISO 19115, and additional ISO metadata standards



# 44 640 The value of “pulldown” menus in mobile data collection allows for certain data to be added without typing. This valuable input technique allows control of input syntax and is a proactive part of  
(Choose the best answer)

- A. Data filtering
- B. Quality Assurance
- C. Cartographic Display
- D. Big data

# 45 641 What are the main reasons for implementing a data archiving system? (Select all that apply)

- A. Cost of primary storage
- B. Ease of access to historical data
- C. Fast Access to the most important data
- D. Various data export formats.

# 46 642 Which of the following is used to extract features *and their* attributes from one layer using a polygon from another as the boundary of the output? (Choose the best answer)

- A. Join
- B. Merge
- C. Union
- D. Clip

# 47 642 Which of the following is used to build new features by splitting overlapping features and combing attributes where the features overlap? (Choose the best answer)

- A. Join
- B. Merge
- C. Union
- D. Clip

# 48 642 Which of the following appends together layers of adjoining area? (Choose the best answer)

- A. Join
- B. Merge
- C. Union
- D. Clip

# 49 644 What are some important considerations when converting hand-drawn features from a hard copy map to digital GIS data? (Select all that apply)

- A. Colors that will be used to show data in final maps
- B. Determining which background data shown on the paper maps is the most accurate to use in georeferencing it
- C. Method the field data collector used to orient themselves
- D. Ability to understand the notations made and to interpret the attributes for each feature

# 50 644 When collecting GPS data, what are the most important factors in determining the accuracy of the resulting data? (Select all that apply)

- A. Using templates or prescribed schemas for feature creation to ensure data quality
- B. The number of and distance between features collected each day
- C. The capabilities of the GPS receiver and alignment of GPS satellites at the moment the data is collected
- D. The battery power of the data collection device

Answer Key:

**1. Conceptual Foundations**

- 1 D
- 2 A
- 3 B
- 4 B
- 5 C
- 6 D

## 2. Cartography & Visualization

- 7 A
- 8 B
- 9 A
- 10 C
- 11 A
- 12 AD
- 13 B

## 3. GIS Design Aspects & Date Modeling

- 14 B
- 15 C
- 16 BC
- 17 A
- 18 ABD
- 19 ABC
- 20 C
- 21 C
- 22 B
- 23 D
- 24 B
- 25 D
- 26 C
- 27 B

## 4. GIS Analytical Methods

- 28 D
- 29 AC
- 30 C
- 31 A
- 32 AB
- 33 A
- 34 A,C
- 35 D

## 5. Data Manipulation

- 36 A
- 37 B
- 38 A
- 39 D
- 40 C
- 41 B
- 42 C

## 6. Geospatial Data

- 43 D
- 44 B
- 45 ABC
- 46 D
- 47 C
- 48 B

49 BD  
50 AC

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