

## Section 7: Preparing for the Examination

### Examination Content

All certification examination content is derived from the Universal GEOINT Essential Body of Knowledge (EBK) and developed using the Criterion Referenced Test Development process. A broad group of subject matter experts (SMEs) from across GEOINT (i.e., government, industry, academia) participated in the development, review, and validation of each examination question. For more details, please see Section 1. The certification exams do not address software-specific approaches, specialized knowledge, or management.

Each certification exam (i.e., GIS & Analysis Tools; Remote Sensing & Imagery Analysis; Geospatial Data Management) is an 80-item test composed of multiple-choice questions of various types. Please see the section below for sample test questions.

Candidates will be given two hours (i.e., 120 minutes) to complete the examination.

### Sample Test Questions

The following sample test questions were developed and validated by SMEs in the field of GEOINT. The correct answer keys are available following the questions. These sample questions will never appear in an operational Universal GEOINT Certification exam.

These sample questions published below are intended to familiarize candidates with the type, format, and content of the questions that appear on the certification examinations. These questions are NOT intended to be a diagnostic or self-assessment for success on the exams, nor are they predictive of success or failure on any certification exam. Candidates should consider opportunities to prepare for the examinations independent of these sample test questions.

## GIS & Analysis Tools Sample Test Questions and Answer Key:

1. An analyst uses a database management system to copy selected records from two source files into a new destination file. Which of the following operations selects only those records that appear in one, but not both, of the source files?
  - A. Intersection
  - B. Difference
  - C. Union
  
2. True or False: Vector is a representation strategy involving sampling attributes at fixed intervals.
  - A. True
  - B. False
  
3. \_\_\_\_\_ generally refers to the spatial arrangement among geographic objects and may be managed within a geographic information system through the application of rules such as "Adjacent to" or "May not have gaps".
  - A. Topography
  - B. Topology
  - C. Proximity
  - D. Connectedness
  
4. Which of the following statements is true regarding geospatial data precision?
  - A. It is common to find mixed resolution data within the same dataset
  - B. Precision is only important to "small scale" analyses and will not affect "large scale" analyses
  - C. A GIS dataset built to map "small scale phenomena" may be inappropriate to use in "large scale" analysis
  - D. Imprecise data is not useful at any scale
  
5. \_\_\_\_\_ is a measure of the accuracy of an entire geospatial dataset.
  - A. Statistical Significance
  - B. Root mean square error
  - C. P-Value
  
6. Which of the following is an accurate statement about a hillshade?
  - A. A hillshade identifies the downslope direction of the maximum rate of change in value from each cell to its neighbors
  - B. Hillshades are used to determine the azimuth faced for each pixel
  - C. Hillshades will vary based on the hemisphere and season of the initial collect
  - D. A hillshade is a process that creates a shaded relief from a surface raster by considering the illumination source angle and shadows

7. The process of using data points with known values to estimate values at unknown points (in same region or nearby region) is called spatial \_\_\_\_\_.
- A. Prediction
  - B. Interpolation
  - C. Adjustment
  - D. Reflection

Answer Key for GIS & Analysis Tools Example Questions:

- 1. B
- 2. B
- 3. B
- 4. C
- 5. B
- 6. D
- 7. B

## Remote Sensing and Imagery Sample Test Questions and Answer Key:

1. Which of the following is produced by atmospheric scattering?
  - A. An oversaturation of the entire visible spectrum
  - B. A hazy appearance in the blue end (400-500 nm) of the visible spectrum
  - C. An undersaturation in the red end (600-700 nm) of the visible spectrum
  - D. A reduction in the exploitability of all satellite imagery
2. The spatial resolution of most of the bands of the Landsat Enhanced Thematic Mapper Plus sensor is \_\_\_\_\_ not including the panchromatic and thermal infrared bands.
  - A. About 1 meter
  - B. About 15 meters
  - C. About 30 meters
  - D. About 80 meters
3. Which two wavelength bands are combined to calculate the Normalized Difference Vegetation Index (NDVI)?
  - A. Near-infrared and thermal infrared
  - B. Visible infrared and thermal infrared
  - C. Visible red and near-infrared
  - D. Visible green and visible red
4. True or False: Principal Component Analysis is the analysis of data to identify and find patterns to reduce the dimensions of a dataset with minimal loss of information.
  - A. True
  - B. False
5. Which of the following is a key strength of principal components analysis (PCA)?
  - A. Material differentiation
  - B. Noise segregation
  - C. Data Reduction
  - D. Anomaly detection
6. True or False: A maximum likelihood classifier is an example of unsupervised image classification.
  - A. True
  - B. False
7. Juan and Esperanza are working with an image with the data confined between the values 97 and 167. Juan says that he can increase the contrast in the image by applying a linear contrast stretch. Esperanza says that he can increase the contrast in the image through the histogram equalization method. Who is correct?
  - A. Juan is correct
  - B. Esperanza is correct

- C. Juan and Esperanza are both correct
- D. Juan and Esperanza are both incorrect

Answer Key for Remote Sensing and Imagery Analysis Example Questions:

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

## Geospatial Data Management Sample Test Questions and Answer Key:

1. Which of the following is used to describe a database that stores and retrieves data in means other than the tabular relations used in relational databases?
  - A. NoSQL
  - B. Cloud
  - C. Full-text
  
2. An Entity-Relationship (E-R) diagram is an appropriate technique for visualizing the spatial relationships among \_\_\_\_\_.
  - A. Non-structured geospatial data
  - B. Structured geospatial data
  - C. Non-structured and structured geospatial data
  - D. Attribute data
  
3. Which of the following statements is/are true regarding geospatial databases?
  - A. Geospatial databases are time stamped in local standard time
  - B. Geospatial databases are time stamped by Julian date and time
  - C. Geospatial databases are typically time stamped in universal coordinated time (UTC)
  - D. Geospatial databases are often time stamped in local daylight time
  
4. In a file with .dbf extension, what does the .dbf stand for?
  - A. dbase format
  - B. database file
  - C. dBASE file
  - D. database format
  
5. Programs that have been developed to provide a more stream-lined interface with a particular data format or schema are termed \_\_\_\_\_.
  - A. Geospatial thesaurus linkers (GTL)
  - B. Application Program Interfaces (API)
  - C. Reverse Coding Systems (RCS)
  - D. Data Conversion Object Programs (DCOP)

6. Which of the following is a true statement?
- A. Web HTML5 APIs provide for interlinkages of geo-locational information from 3D and 2D interactive graphics.
  - B. Bing Maps and Google Maps automatically capture geo-locational data through spatial API's.
  - C. Only Web GL provides JavaScript for geospatial analysis
  - D. Silverlight and Python are the only languages that enable geospatial programming interfaces.
7. Joe is working on a project involving extracting details from multiple commercially available databases. Unfortunately, the data all have generic titles. Dean, his boss, recommends that he open a new map session and bring all the data in and then extract that which he needs. Joe feels that, since the databases have extensive metadata, he can simply query that for the specific layers he needs rather than open everything. Who is correct?
- A. Dean is correct
  - B. Joe is correct
  - C. Dean and Joe are correct
  - D. Dean and Joe are incorrect

Answer Key for Geospatial Data Management Example Questions:

- 1. A
- 2. C
- 3. C
- 4. B
- 5. B
- 6. A
- 7. B

## Study Resources

USGIF used the following resources to develop the Universal GEOINT EBK:

- GIS&T Body of Knowledge
- DoL Geospatial Technology Competency Model
- NGA PL-1 Certification Blueprint
- Canada Centre for Remote Sensing, Fundamentals of Remote Sensing
- Joint Publication 2-03, Geospatial Intelligence in Joint Operations
- Army Techniques Publication 3-34.80, Geospatial Engineering, Headquarters, U.S. Department of the Army
- Homeland Security Geospatial Concept of Operations (GeoCONOPS), U.S. Department of Homeland Security
- GeoTECH Center, Meta-DACUM Job/Occupation Analysis, GIS & Remote Sensing

The Universal GEOINT Certification Program is designed to be explicitly *training and/or education-agnostic*; the certification examinations are not explicitly aligned with any preparation materials, and no specific training and/or education materials are required to prepare candidates for the examinations or guarantee success on the examinations. It is the professional responsibility of certification candidates to prepare themselves for the content on the certification examinations.

At some future date Universal GEOINT Certification Governance Board may empanel a task force of subject matter experts (SMEs) to compile a study guide that may help candidates prepare for the certification exams. In the interim, textbooks, courses, manuals, and/or other reference material aligned with the following topics may be helpful as candidates prepare themselves for the certification examinations.

GIS & Analysis Tools	Remote Sensing & Imagery Analysis	Geospatial Data Management
<ul style="list-style-type: none"> <li>• GIS</li> <li>• Spatial Analysis</li> <li>• Geostatistics</li> <li>• Geography</li> </ul>	<ul style="list-style-type: none"> <li>• Remote Sensing</li> <li>• Imagery Processing, Enhancement, and Transformation</li> <li>• Imagery Classification</li> <li>• Imagery Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Data Types &amp; Structures</li> <li>• Database Design and Database Management</li> <li>• Data Security and Data Encryption</li> <li>• Basic Programming &amp; Development</li> </ul>