

**Chapter 1: A Survey of GIS for Disaster Management**

**1. The support and information management role of GIS in disaster management comes primarily through:**

- A. Databases
- B. Maps
- C. Graphics
- D. Computers

**2. Which of the following is the best definition of the “geographical context of a disaster” (select one):**

- A. News reporter asking for the basic “who, what, where, why, and how” aspects of a disaster situation
- B. First responder asking where supplies are located.
- C. Decision makers asking for the basic “how much will this cost” aspects of a disaster situation.
- D. Private citizen asking “when” will the power be restored after a disaster.

**3. Which question below is an example of GIS to facilitate disaster-management reasoning (select one):**

- A. What are the number of people impacted by the disaster?
- B. Where are supplies located?
- C. How did an area become vulnerable to a disaster?
- D. What is the status of the movement of relief supplies?

**4. Interactive querying capabilities of GIS allow for (select one):**

- A. Incorporation and sharing data in varying formats with other disaster-management teams.
- B. Making comparisons to understand how a disaster evolved.
- C. Quick access to information that would otherwise be difficult to obtain.

D. Areas of interest to be quickly viewed.

**5. Which of the following is the best definition of situation assessment (select one):**

- A. A process where information about the relevant factors in the environment is acquired.
- B. All of the factors that must be accounted for by a disaster-management team to guide and direct actions being taken.
- C. Comprehension of the state of the environment within a geographic extent.
- D. Making maps that show disaster locations.

**6. Which of the following best illustrates problems with recent disasters like 2017 Hurricanes Harvey and Maria, 2018 California Wildfires, 2019 flooding in the Mid-West USA, and Tropical Cyclone Idai in southeast Africa (select one):**

- A. Larger and increasingly diverse segments of society are being impacted by disasters.
- B. Computing power is not able to keep up with data-demands for disaster response.
- C. Disaster are having less impact on society, this requiring decreased use of GIS for disaster management.
- D. Coordination, sharing, and interoperability of non-GIS resources.

**7. Which statement best describes the combined challenges of Humanitarian Crisis and GIS (select one):**

- A. Lack of spatial thinking skills among disaster management professionals.
- B. Changes in climate and weather conditions and their effects on natural hazards are even more pronounced at the international scale.
- C. Refugee camps are often located in remote locations of a host country lacking infrastructure for access or are on lands generally not suitable for human settlement
- D. Many of the countries where these types of situations occur often suffer from their own lack of development and capacities for handling situations

**8. An example of challenges that still exist in the coordination, sharing, and interoperability of GIS resources would be:**

- A. Lack of comprehensive infrastructures for data sharing across local, state, and federal resources.
- B. Lack of comprehensive computer resources for first responders.
- C. Overabundance of infrastructures for data sharing across local, state, and federal resources.
- D. Lack of comprehensive use of drones by local, state, and federal agencies.

**9. A mapping mashup is:**

- A. A combination of myriad data sources onto a map.
- B. A combination of myriad maps sources into a database.
- C. A combination of myriad pictures sources into a database.
- D. A combination of myriad spatial thinking operations on a map.

**10. Which of the following is NOT a component of spatial thinking (select one):**

- A. Properties of space.
- B. Visual representations.
- C. Reasoning processes.
- D. Properties of reasoning.

**Chapter 2: Fundamentals of Geographic Information and Maps**

**1. Information is raw facts or observations (True or False).**

- A. True
- B. False

**2. Which statement best describes the difference between small-scale and large-scale maps (select one)?**

- A. Small-scale maps show a smaller area with more detail, a large-scale map shows a larger area with less detail.
- B. Small-scale maps show a larger area with less detail, a large-scale map shows a smaller area with more detail.
- C. Small-scale maps show a larger area with more detail, a large-scale map shows a smaller area with less detail.
- D. Small-scale maps show a smaller area with less detail, a large-scale map shows a larger area with more detail.

**3. Which statement is a key point about map projections (select one)?**

- A. Few types of projections have been devised.
- B. Some map projections distort.
- C. Only one projection is best for applications to disaster management.
- D. All map projections distort.

**4. Latitude and longitude coordinates are (select one):**

- A. Spherical coordinates that use the measures of angles for latitude longitude values.
- B. Planar coordinates that use A, B values for latitude longitude values.
- C. Spherical coordinates that use the measures of lines for latitude longitude values.

D. Planar coordinates that use 60 zones that span 6° of longitude each for latitude longitude values.

**5. Which statement best describes why it is very important to know what the datum is when working with GIS data (select one)?**

A. A horizontal datum (based on a reference ellipsoid and control points) is used to mathematically define the earth's shape.

B. A coordinate system can be derived from an agreed-upon origin point based on map projections optimized for a particular region.

C. Different datums can cause the same location to have significantly different coordinate values depending on the datum reference.

D. The datum impacts the visual display of a map in terms of projection lines.

**6. Which of the following is example of nominal data (select one)?**

A. Non-numerical landuse codes.

B. Road network categories.

C. Temperature.

D. A person's age.

**7. Which of the following are examples of visual variables (select one)?**

A. Resolution, scale, and extent.

B. Contrast, hierarchy, importance.

C. Nominal, interval, and ratio.

D. Size, shape, and orientation.

**8. A thematic map convey a specific message or distributions of one or more attributes or relationships among several attributes (True or False).**

A. True

B. False

**9. Which of the following are examples of common map elements (select one)?**

A. Label, variables, and symbols.

B. Database, theme, distortion lines.

C. Inset, scale, and frame and neat lines.

D. Points, lines, and polygons.

**10. Which statement best describes the problems with this example map legend entry:**

**+ Location\_of\_new\_schools**

A. The legend will not fit inside an inset map.

B. The symbol used is not intuitive.

C. There are too many words to describe the legend entry.

D. The use of underscores makes the legend entry look strange.

**Chapter 3: Geographic Information Systems**

**1. Which of the following are components of GIS? (select one).**

- A. Raster, Vector, TIN, Metadata, Projections
- B. Maps, GPS, Drones, Software, Computers, Information
- C. Software, Hardware, People, Knowledge, Data, Network
- D. Knowledge, Skills, Maps, Mobile, People, Code

**2. Which of the following is the best description of the importance of map layers in GIS? (select one).**

- A. Map layers allow GIS to organize data into one common geographic view.
- B. Map layers allow GIS to project data “on the fly”.
- C. Map layers allow GIS to organize data into several different views depending on how the data was collected.
- D. None of the other choices.

**3. SQL is an acronym for:**

- A. Structured Quantum Linguistics
- B. Simple Query Language
- C. Spatial Query Language
- D. Structured Query Language

**4. Which of the following is the best description of the use of GIS Programming and Application Programming Interfaces APIs? (select one).**

- A. Accomplish tasks that out-of-the-box GIS software can accomplish without having to build custom software applications or tools.
- B. For programming data applications at the interface of spatial and geospatial to transform raster and vector data sets.
- C. For applications that program user interfaces for analysis, cartography, and map production.
- D. Build custom software applications or tools to accomplish tasks that out-of-the-box GIS software might not be able to accomplish.

**5. Which of the following are dynamic visual variables? (select one).**

- A. Shape, Color, Hue, Size, Orientation, Saturation
- B. Duration, Rate of change, Order, Display date, Frequency, Synchronization
- C. Color, Hue, Duration, Rate of change, Size, Orientation
- D. Raster, Vector, TIN, Network, Shapefile, CSV, Synchronization

**6. The Vector GIS data model represents features as a continuous grid of cells (True or False):**

- A. True
- B. False

**7. The Raster GIS data model represents features as a discrete, vertex-based shapes (True or False):**

- A. True
- B. False



**8. GIS Metadata is (select one):**

- A. Data about data.
- B. Data about information.
- C. Data about maps.
- D. Data about HTML.

**9. QGIS is an open-source GIS package (True or False):**

- A. True
- B. False

**10. Which of the following is the best definition of Open Data?**

- A. Data are published and made commercially accessible to anyone so as to choose to use them and redistribute them.
- B. Data are published and made freely accessible to anyone so as to choose to use them but with strict licensing and control of distribution by the data publisher.
- C. Data are published and made freely accessible to anyone so as to choose to use them and redistribute them.
- D. Data are open for review to publish and made freely accessible to anyone after licensing boards determine distribution rights.

**Chapter 4: Geographic Information Systems and Allied Technologies**

**1. Which of the following are GPS segments (select one).**

- A. User, Map, Data
- B. Space, Control, User
- C. Control, Space, Hardware
- D. User, Control, Network

**2. What are the minimum number of GPS satellites needed to calculate a position?**

- A. 3
- B. 4
- C. 2
- D. 5

**3. Which of the following is the best definition of a GPS multipath error (select one):**

- A. Calculate position error from the signals received by comparing with a well-known point location.
- B. Too many obstacles such as forests, buildings, steep mountains obstruct the GPS signal.
- C. The satellite signal bounces around traveling through the ionosphere and the troposphere.
- D. The GPS signal is reflected off objects before reaching the receiver.

**4. Which of the following are the best examples of standard autopilot features on consumer-grade UAS (select one).**

- A. Auto-return home, differential correction, power backup
- B. Waypoints, WAAS, controller link
- C. Auto-takeoff, Points of interest, Fail safe
- D. Points of interest, WRS, Auto-landing

**5. Which of the following is the best definition of remote sensing (select one)?**

- A. Acquisition of data about an object by being in physical contact with it.
- B. Acquisition of information about an object without being in physical contact with it.
- C. Acquisition of information about a dataset using physical sensing techniques.
- D. Acquisition of data about an object by mapping using a GPS receiver.

**6. Spatial Resolution is the energy magnitude a given phenomenon emits or reflects across various wavelengths (True or False).**

- A. True
- B. False

**7. Which of the following demonstrates an example of the importance of remote sensing change detection in disaster management application (select one)?**

- A. Comparing before and after disaster impact imagery such as areas impacted by floods.
- B. Comparing before and after disaster vector datasets such as areas impacted by floods.
- C. Comparing before and after disaster social media feeds such as areas impacted by snow storms.
- D. Comparing the pixel values within a single image such as areas impacted by floods.

**8. What is the International Charter on Space and Major Disasters (or “the International Charter”) (select one)?**

- A. The officially mandated UN program with a mission focused on building capacity for the use of space-based information within the full disaster management cycle.
- B. A program that uses NASA assets to support disaster applications around the world.
- C. A worldwide collaboration, through which satellite data are made available for the benefit of disaster management.
- D. A service of the German Aerospace Center where geo data are acquired and analyzed in order to generate up-to-date situational awareness information before, during or after a disaster situation or in case of major events.

**9. Indoor navigation and positioning is (select one):**

- A. Tracking locations of people or objects inside of buildings.
- B. Acquiring, processing, and interpreting images that record the interaction between electromagnetic energy and matter.
- C. Tracking locations of people or objects at geo-spatial scale.
- D. The system to calculate the position or coordinate on the earth’s surface.

**10. Which of the following best outline challenges with indoor maps (2D or 3D) to support indoor navigation (select one)?**

- A. Indoor maps (2D or 3D) can be difficult to re-project on-the-fly.
- B. Indoor maps (2D or 3D) can be difficult to process visual variables used.
- C. Indoor maps (2D or 3D) can be difficult to obtain, create, and/or standardize.
- D. Indoor maps (2D or 3D) are often subject to organizational sharing restrictions.

**Chapter 5: Disaster Management and Geographic Information Systems**

**1. A disaster is a disruption that is greater than the local capacity to cope with the event, thus involving resources and officials at multiple levels such as local and state officials (True or False).**

- A. True
- B. False

**2. Which of the following are phases of the disaster management cycle (select one)?**

- A. preparedness, MOU, response, mitigation
- B. preparedness, response, recovery, mitigation
- C. response, preparedness, recharge, protection
- D. emergency, crisis, disaster, catastrophe

**3. Which of the following is the best description of the use of GIS in the Incident Command System (ICS) (select one)?**

- A. GIS use in the Planning Section to prepare IAPs (Incident Action Plans) and incident maps.
- B. GIS use in the General Staff to generate situation awareness reports.
- C. GIS use in the Logistics Section to prepare routing fuel needs and staff time.
- D. GIS use by technical specialists to prepare cost/benefit conceptual maps.

**4. SDI stands for (select one):**

- A. Spatial Data Implementation
- B. Special Designated Infrastructures
- C. Spatial Data Infrastructures
- D. Spatial Deposit Information

**5. Which of the following is the best description of the value of GIS Clearinghouses for Disaster Management (select one)?**

- A. GIS Clearinghouses provide a forum for an international community of GIS users to share specific data from their town, village, county, or other organizational activities.
- B. GIS Clearinghouses provide a forum for processing vector and raster datasets for one organization.
- C. GIS Clearinghouses provide a forum for a statewide community of GIS users to share specific data from their town, village, county, or other organizational activities.
- D. GIS Clearinghouses provide a forum for FEMA in planning, preparing, recovering, and rebuilding activities.

**6. How might a government agency rely on external, private sector GIS contractors (select one)?**

- A. GIS data development, GIS software application development, map production analysis.
- B. Provide central GIS command-and-control structures to manage and coordinate very large-scale disasters spanning international boundaries.
- C. Participate in functional area briefings and GIS after-action reports.
- D. Address language, cultural, and social barriers between foreign GIS responders and native GIS technicians.

**7. Which of the following is the best description of one issue with international disaster management (and response in particular) (select one)?**

- A. Lack of central command-and-control structures to re-project datasets in real time that are from very large-scale disasters spanning international boundaries.
- B. Lack of central command-and-control structures to manage and coordinate very large-scale disasters spanning international boundaries.
- C. Working with unclear GIS metadata and politics of GIS software adoption.
- D. Operation in countries with unstable social media systems.

**8. Which of the following is an important focus of World Bank Global Facility for Disaster Reduction and Recovery (GFDRR) (select one)?**

- A. Disaster risk reduction is a mapping challenge.
- B. Disaster risk reduction is a GIS technical challenge.
- C. Disaster risk reduction is an application programming challenge.
- D. Disaster risk reduction is a development challenge.

**9. The Sendai Framework for Disaster Risk Reduction is an insignificant disaster risk reduction framework followed by few members of the international community (True or False).**

- A. True
- B. False

**10. Which of the following is the best description of the United Nations Disaster Assessment and Coordination (UNDAC) (select one)?**

- A. UNDAC's primary mission is to serve an information management coordination role through the collection, maintenance, and dissemination of humanitarian information to the humanitarian community.
- B. UNDAC is a technology-intensive program of the United Nations Institute for Training and Research (UNITAR).
- C. UNDAC teams support people who are displaced by a natural disaster, violent conflict, or any other situation that causes people to leave their home country seeking refuge in another country (refugees).
- D. UNDAC teams are deployed during the first phase of a rapid-onset emergency to support the UN and governments of disaster-affected countries.

**Chapter 6: Geographic Information Systems and Disaster Planning and Preparedness**

**1. Which of the following is the best example of how geographic information capacity (GIC) is applicable to disaster planning and preparation (select one)?**

- A. Insufficient use of spatial statistics for public outreach and citizen participation during disaster planning and preparation activities.
- B. Overuse of public outreach and citizen participation during disaster planning and preparation activities.
- C. Insufficient availability of digital geographic information to support disaster-response decision-making.
- D. Overuse of vector data models when raster models provide better decision making capacity.

**2. Which of the following are the best examples of essential disaster management map layers (select one)?**

- A. cadastral data, geodetic control, hydrography, geographic area boundaries
- B. geographic area boundaries, social media points, space-based data, retail locations
- C. raster, vector, TIN, networks
- D. hydrography, soil conditions, slope run off, troposphere

**3. A “data model”, as per the discussions on essential disaster management map layers is how real-world entities are modeled in terms of database representations and relationships between entities and conceptual hierarchies (True or False)?**

- A. True
- B. False

**4. MOU stands for (select one):**

- A. Memorandums of Unification
- B. Memorandums of Understanding
- C. Majority of Understanding



D. Minimum of Understatement

**5. Which of the following is a best example of attributes that must be available within a road network dataset for evacuation route plans (select one)?**

- A. The data types of the road network dataset attributes.
- B. The type of pavement for which the road is rated.
- C. The projection of the road network dataset.
- D. The speed for which the road is rated for travel.

**6. Spatial factors to include in defining evacuation zones include (select one):**

- A. shelter names, elevation controls, access to GIS datasets
- B. shelter locations, elevation, access to medical facilities
- C. highway shields, radio towers, fire hydrants, police service areas
- D. map coverage, network directions, shelter materials, GPS signals

**7. A tabletop exercise is (select one):**

- A. Using a simulation to assess and test the ability of an individual to respond to the given GIS operation.
- B. Placing maps on a table to exercise possible outcomes to the given scenario.
- C. Using a variety of approaches such as straight-line distance, Euclidean distance, or travel time to respond to the given scenario.
- D. Using a simulation to assess and test the ability of a group to respond to the given scenario.

**8. Heat mapping is a technique to find statistically high or low value clusters, hot spot mapping is a technique for density mapping (True or False).**

- A. True
- B. False

**9. Which of the following is a good reason to use paper maps for public outreach communication (select one)?**

- A. This medium is accessible to a very wide range of people.
- B. Provides mapping techniques to counter dominant power structures to achieve broader goals.
- C. This medium is accessible to a very wide range of GIS specialists.
- D. Paper maps are effective for overcoming issues related to distortions caused by map projections.

**10. As GIS for disaster management grows more important with the increase and intensity of natural disasters, average citizens increasingly are (select one):**

- A. Both disaster survivors and planners.
- B. Both disaster mappers and managers.
- C. Both disaster survivors and responders.
- D. Both disaster professionals and GIS technicians.

**Chapter 7: Geographic Information Systems and Disaster Response**

**1. Which of the following statements best describe the relationship between GIS and the US National Response Framework (NRF) (select one)?**

- A. Functionality provided by geographic information systems can be applied to a single response core capability.
- B. Functionality provided by geographic information systems can be applied across multiple response core capabilities.
- C. Functionality provided by geographic information systems can be applied across multiple datasets maintained via the United States Department of Homeland Security.
- D. Functionality provided by geographic information systems can be applied across multiple response data management tasks such as metadata management.

**2. International Disaster-Response Laws, Rules, and Principles (IDRL) are a comprehensive framework supported by core international treaties, such as the Geneva Conventions (True or False)?**

- A. True
- B. False

**3. Which of the following is a basic fact about GIS in Emergency Operation Centers (select one)?**

- A. GIS has limited use in an EOC, a GIS supervisor or analyst might be possibly be available, but usually not.
- B. An EOC will typically have a dedicated logistics technician who is tasked with providing real-time updates on the large printed boards found in an EOC.
- C. An EOC will typically have a dedicated GIS supervisor or analyst who is tasked with providing real-time updates on the large screens found in an EOC.
- D. The time-sensitive nature of disaster response dictates that social media accounts of the disaster response organization are monitored.

**4. In terms of GIS and disaster warnings (select one):**

- A. GIS can be used to determine the exact moment at which the disaster warning or evacuation order should be issued.
- B. GIS is an important tool to warn disaster response staff that maps will be needed for disaster response.
- C. GIS is an important tool to develop cartographic symbols that will warn decision makers about possible shape and size distortions in disaster representations.
- D. GIS is an important tool to warn the public about the exact moment at which a map reading order will be issued.

**5. Which of the following statements best describe the usefulness of heat mapping for disaster response (select one)?**

- A. Heat mapping is inherently designed to show aggregated data using statistics to define data class breaks.
- B. Heat mapping can be a useful technique for understanding where patterns are emerging from large data input volumes.
- C. Heat mapping defines areas of high and low statistical significance based on spatial relationships and feature attributes values.
- D. Heat mapping is a connection of sensors, hardware, virtual devices, and other “everyday” devices through networks and the Internet.

**6. A “Geo fence” is:**

- A. A predefined border of data pixels.
- B. A way to collect data in real time.
- C. A way to process and filter data.
- D. A predefined area of interest.

**7. Which of the following statements best describes one of the specific issues to keep in mind in the context of a disaster-response GIS product framework (select one)?**

- A. It is very important to keep in mind the capacities of data filters that will influence GIS products created during a disaster response.
- B. The high visibility of disaster-response activities has increasingly drawn the interest of large information technology and data companies such as Google, Microsoft, and Esri.
- C. It is very important to keep in mind the capacities of people who are the actual responders and consumers of GIS products created during a disaster response.
- D. Web-based map presentation can have the disadvantage that end users do have to purchase expensive software licenses associated with commercial software for viewing maps.

**8. Online disaster-response geographic data streams can be used to complement official government data sources (True or False).**

- A. True
- B. False

**9. Damage assessment is an excellent example of the use of GIS in a field-based or mobile capacity because (select one):**

- A. A mobile device can capture social media data (often with the use of multiple accounts and the built-in camera and video-recording features of the device) to conduct damage assessments.
- B. A mobile device can capture field data (often with the use of the global positioning system receiver and the built-in camera and video-recording features of the device) to conduct damage assessments.
- C. Various organizations around the world will provide free satellite imagery during a disaster response.
- D. When specific products are developed, they can have a variety of uses such as situation awareness, decision support, and public communication.

**10. Which of the following statements best describes the activities of a crisis mapper (select one)?**

- A. Monitor state GIS clearinghouses for any information that could be relevant for incorporating into a crisis map.
- B. Monitor computer hardware capacities in case a crisis occurs that impacts the development of a crisis map.
- C. Monitor media reports and social media (i.e., Facebook and Twitter) for any information that could be relevant for incorporating into a crisis map.
- D. None of the other choices.

**Chapter 8: Geographic Information Systems and Disaster Recovery**

**1. Disaster recovery is: (select one)?**

- A. Capabilities necessary to reduce loss of life and property by lessening the impact of disasters.
- B. The overall ability of a community, society, government, or other organization to support disaster risk management initiatives by utilizing geographic information to make informed, evidence-based decisions and achieve agreed upon goals.
- C. Transition of the built environment, business, people, and their communities back to a state of acceptable operation after a disaster event.
- D. A guide to how the Nation responds to all types of disasters and emergencies.

**2. Which of the following best describes an example of use of GIS for short-term disaster recovery (select one)?**

- A. Identifying risks and vulnerabilities and communicating with community members about opportunities for more resilient rebuilding
- B. Determining the best locations to place health centers.
- C. Debris and infrastructure activities.
- D. Identifying people in specific shelters.

**3. Which of the following best describes an example of the use of GIS for intermediate disaster recovery (select one)?**

- A. Identifying risks and vulnerabilities and communicating with community members about opportunities for more resilient rebuilding
- B. Determining the best locations to place pet centers.
- C. Debris and infrastructure activities.
- D. Identifying people in specific shelters.

**4. Which of the following is an example of 'Support for coordinated activity' as per the Geocollaboration framework applied to disaster-recovery tasks (select one)?**

- A. Using maps as objects to coordinate the efforts of teams working together on recovery tasks such as debris removal.
- B. Large-sized map displays used to show locations of various entities relevant to a situation.
- C. Using artifacts such as push pins that signify the open, proposed, or closed status of a disaster-recovery shelter.
- D. Using GIS to create livelihood opportunity for displaced people.

**5. GIS can play an important role in critical infrastructure vulnerability planning and restoration activities through the visualization of physical proximity and the distribution of critical capabilities across a region (True or False).**

- A. True
- B. False

**6. Restriction representations in network analysis tools can be represented by (select one):**

- A. points, TINs and lines
- B. polygons, rasters, and points
- C. points, lines, and polygons
- D. points, lines, and projections



**7. Which of the following best describes sustainable debris recovery (select one)?**

- A. The consideration of clean-energy technologies and sustainability factors in the processing of disaster-created debris.
- B. Conducting an analysis as to which barriers should be removed to recover sustainable transportation systems.
- C. Involving the public in broader disaster-recovery activities for sustainable community engagement.
- D. Using maps to advocate, visualize, and sustainably make sense of complex debris recovery issues.

**8. Which of the following best describes what a service area generated by a networking algorithm is (select one)?**

- A. A set distance, represented as a raster grid surface, from an origin (such as the debris-collection facility point) that can be traveled on the underlying transportation network.
- B. A set distance, represented as a polygon, from a travel destination midpoint (such as a pharmacy) that can be traveled on the underlying transportation network.
- C. A set distance, represented as a points and lines, from an origin (such as the debris-collection facility point) that can be traveled on the underlying transportation network.
- D. A set distance, represented as a polygon, from an origin (such as the debris-collection facility point) that can be traveled on the underlying transportation network.

**9. Which of the following best describes why simple, easy-to-understand paper-based maps are useful for recovery planning (select one)?**

A. The widest range of GIS technician views can be captured and incorporated into broader recovery-planning and decision-making processes.

B. Service area definitions can easily be modified such as by moving facility locations, modifying service boundary destinations, or adding point, line, or polygon restrictions.

C. Better understanding of (1) the volume and type of debris to be removed and (2) where specific debris can be moved (for example, a general landfill vs. a specialized waste facility location that specializes in hazardous materials).

D. The widest range of stakeholder views can be captured and incorporated into broader recovery-planning and decision-making processes.

**10. Disaster-mitigation activities are often completely separate from disaster-recovery activities (True or False)?**

A. True

B. False

**Chapter 9: Geographic Information Systems and Disaster Mitigation**

**1. Disaster mitigation is: (select one)?**

- A. Capabilities necessary to reduce loss of life and property by lessening the impact of disasters.
- B. The overall ability of a community, society, government, or other organization to support disaster risk management initiatives by utilizing geographic information to make informed, evidence-based decisions and achieve agreed upon goals.
- C. Transition of the built environment, business, people, and their communities back to a state of acceptable operation after a disaster event.
- D. A guide to how the Nation responds to all types of disasters and emergencies.

**2. Vulnerability is: (select one)?**

- A. The ability of a system or community to withstand the impacts of an event and recover to an acceptable or existing or even an improved state in comparison to what was available before an event.
- B. Conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.
- C. Transition of the built environment, business, people, and their communities back to a state of acceptable operation after a disaster event.
- D. The overall ability of a community, society, government, or other organization to support disaster risk management initiatives by utilizing geographic information to make informed, evidence-based decisions and achieve agreed upon goals.

**3. Resilience is: (select one)?**

- A. The ability of a system or community to withstand the impacts of an event and recover to an acceptable or existing or even an improved state in comparison to what was available before an event.
- B. Conditions determined by physical, social, economic and environmental factors or processes which increase the susceptibility of an individual, a community, assets or systems to the impacts of hazards.
- C. Transition of the built environment, business, people, and their communities back to a state of acceptable operation after a disaster event.
- D. The overall ability of a community, society, government, or other organization to support disaster risk management initiatives by utilizing geographic information to make informed, evidence-based decisions and achieve agreed upon goals.

**4. Which of the following are examples of the seven core capabilities of the United States Department of Homeland Security National Mitigation Framework (select one)?**

- A. Critical Transportation, Mass Care Services, Fatality Management Services
- B. Risk and Disaster Resilience Assessment, Community Resilience, Long-term Vulnerability Reduction
- C. Sustainable Development Goals (SDGs), sub-national population geospatial reference data development, Memorandums of understanding (MOUs)
- D. Provide support for human dialogue, information sharing, negotiation, and discussions

**5. UNDRR stands for:**

- A. United Nations Office for Development Resilience Rise
- B. United Nations Office for Data Risk Reduction
- C. United Nations Office for Disaster Resilience Regeneration
- D. United Nations Office for Disaster Risk Reduction

**6. Which statement best describes what a spatial index is (select one)?**

- A. A position of a vector element inside of a geodatabase schema.
- B. A method for quickly finding a preexisting spatial unit or geographical region based on location.
- C. A numerical value assigned to a preexisting spatial unit or geographical region.
- D. A mechanism makes for finding out information about the use of GIS for disaster risk reduction activities around the world.

**7. Which of the following are examples of social variables (select one)?**

- A. Age, Gender, Rural/urban, Education level
- B. Building material, Slope percentage (%), Proximity to flood zones, Locations of critical infrastructures
- C. Raster, Vector, TIN, Network
- D. Medical supplies, Origins, Destinations, and Endpoints

**8. Which of the following are examples of physical variables (select one)?**

- A. Age, Gender, Rural/urban, Education level
- B. Raster, Vector, TIN, Network
- C. Building material, Slope percentage (%), Proximity to flood zones, Locations of critical infrastructures
- D. medical supplies, origins, destinations, and endpoints

**9. Which statement best describes what a site-selection technique is (select one)?**

A. Answering a question or testing a hypothesis by overlaying and comparing a variety of non-spatial variables of equal weight that are combined to select final candidates to create a final index score or match site-selection criteria.

B. Answering a question or testing a hypothesis by overlaying and comparing a variety of spatial variables that can be weighted and combined to select final candidates to create a final index score or match site-selection criteria.

C. Answering a question or testing a hypothesis by overlaying and comparing a variety of vector layers that are combined to select a single candidate to create a final index score or match site-selection criteria.

D. Answering a question or testing a hypothesis by overlaying and comparing a variety of raster layers that can be weighted and reviewed individually to select final candidates to create a final index score or match site-selection criteria.

**10. The Weighted Overlay Tool allows raster datasets to be combined together and weighted based on a given layer's importance (True or False).**

A. True

B. False

**Chapter 10: Special Topics, Future Technology, Professional Career Options, and Geographic Information Systems Trends**

**1. Which statement best describes what big data is (select one)?**

- A. Datasets that use known values to estimate unknown values.
- B. Datasets where the volume, variety, and velocity challenge the thinking and existing techniques surrounding these issues.
- C. Datasets that determine where the category an object should be placed in based on a training set.
- D. Clustering dataset groups observations based on similar values or locations.

**2. Machine Learning is (select one):**

- A. Using known values to estimate unknown values.
- B. A wide variety of different database technologies that were developed in response to the demands presented in building modern applications.
- C. Using machines to learn from experience, adjust to new inputs and perform human-like tasks.
- D. A set of data-driven algorithms and techniques that automate the prediction, classification, and clustering of data.

**3. Data Prediction is (select one):**

- A. Which category an object should be placed in based on a training set.
- B. Using known values to estimate unknown values.
- C. Grouping observations based on similar values or locations.
- D. A completely digital, virtual world that a person immerses themselves in with something like a special pair of goggles.

**4. Data Classification is (select one):**

- A. Which category an object should be placed in based on a training set.
- B. Using known values to estimate unknown values.
- C. Grouping observations based on similar values or locations.
- D. A completely digital, virtual world that a person immerses themselves in with something like a special pair of goggles.

**5. Data Clustering is (select one):**

- A. Which category an object should be placed in based on a training set.
- B. Using known values to estimate unknown values.
- C. Grouping observations based on similar values or locations.
- D. A completely digital, virtual world that a person immerses themselves in with something like a special pair of goggles.

**6. Augmented Reality is (select one):**

- A. A completely digital, virtual world that a person immerses themselves in with something like a special pair of goggles.
- B. Digital artifacts placed on top of real-world scenes.
- C. Spatial patterns and process that draw upon machine learning, artificial intelligence and deep learning algorithms.
- D. Augmenting known values to estimate unknown values.

**7. Geographic Information Science is focused on out-of-the-box software such as QGIS or ArcGIS (True or False):**

- A. True
- B. False



**8. Which statement best describes why it is invaluable to review a copy of a previously funded research proposal (select one):**

- A. Looking at the shape and form of arguments that are made to make a successful proposal.
- B. To directly match what the funding opportunity is looking for.
- C. Identify common mistakes that often lead to declined proposals.
- D. To avoid using specific jargon and terms that might not be understood from people outside your specific discipline.

**9. When developing a GIS for disaster management career, you should focus your time exclusively on learning out-of-the-box GIS skills (True or False):**

- A. True
- B. False

**10. It is important to keep up with current trends in GIS and disaster management as both fields are in a constant state of change (True or False):**

- A. True
- B. False