**GIS Question –GIS- Test Bank- 2020- Dr. Hatem**

**Multiple Choice**

1. \_\_\_\_\_\_\_\_\_\_ is NOT maintained with a Mercator projection.

a. True size

b. True shape

c. True compass bearing

d. True location

2. Maximum longitude is:

a. 180° E

b. 180° W

c. 90° N

d. 180° E and 180° W

3. The major problem encountered in map making is that:

a. it is tedious and time consuming

b. there is a lack of international standardization

c. it is impossible to show true size and true shape on the same map

d. There are no major problems.

4. Earth's two fixed reference points are:

a. the North and South Poles

b. the North Star and Southern Cross

c. the Tropics of Capricorn and Cancer

d. all of these

5. The computer-based technology that represents a “marriage” between computer cartography and database management is:

a. spatial analysis

b. geographic information system (GIS)

c. spectral analysis

d. multi-spectral scanning

6. A map capable of showing true direction is called a(n):

a. focal map

b. planar mapc. Mercator map

d. Azimuthal map

7. Perhaps the most important development in remote sensing techniques in the last 40 years has been:

a. aerial photography

b. SONAR

c. Earth-orbiting satellites

d. Side-looking RADAR (SLAR)

8. Cartography is the science of:

a. surveying

b. navigation

c. map making

d. data collection

9. Maximum latitude is reached at the:

a. Prime Meridian

b. North and South Poles

c. Tropics of Capricorn and Cancer

d. Equator

10. The circle of illumination divides Earth into two hemispheres known as:

a. east and west

b. north and south

c. day and night

d. summer and winter

11. The Mercator map is actually a \_\_\_\_\_\_\_\_\_\_ type of projection that has been mathematically derived.

a. conical

b. cylindrical

c. planar

d. interrupted

12. A small-scale map:

a. shows small areas of Earth's surface

b. includes greater detail

c. has a small denominator in its representative fraction

d. all of these

e. none of these

13. Latitude measurement \_\_\_\_\_\_\_\_\_\_ as one moves away from the equator.

a. increases

b. decreases

c. does not vary

d. none of these

14. Contour maps:

a. provide the reader with an idea of the lay of the land

b. are also referred to as "dot maps"

c. show distribution of any feature on Earth's surface

d. are used to show lines of equal temperature

15. A degree of latitude is subdivided into:

a. centitudes and millitudes

b. hours, minutes, and seconds

c. minidegrees

d. minutes and seconds

16. Which of the following is an example of a verbal scale?

a. 1:10, 000

b. 1 inch to 10 miles

c. | —-| —-| —-| —-| —-|

d. none of these

17. On a standard near-infrared (false-color) photograph or digital image, the color red represents:

a. areas that are hot

b. growing vegetation

c. areas of barren land

d. roads

18. In the Public Lands Survey System, one section equals:

a. 36 square miles

b. 6 square kilometers

c. 640 acres

d. all of these

19. Which of the following are advantages of remote sensing systems?

a. They provide rapid, worldwide coverage of the environment

b. They can easily acquire information on inaccessible locations

c. They can be used to locate valuable natural resources

d. All of these are correct.

20. The term "parallels" refers to:

a. lines of longitude

b. lines of latitude

c. lines of meridian

d. great circle routes

21. One degree of latitude is approximately equal to:

a. 7 miles

b. 112 miles

c. 69 miles

d. 11.2 miles

22. One feature that is NOT an advantage of a map is:

a. it is a distortion-free presentation of features and relationships on Earth's surface

b. it can be reproduced easily and cheaply

c. it can depict an area in various degrees of detail

d. it is easy to handle and transport

23. Doppler weather radar systems are mainly designed to produce images of:

a. wind speed and directions on clear days as well as stormy days

b. precipitation patterns and amounts by seeing through clouds

c. temperature patterns in the atmosphere

d. All of these are correct.

24. Why are digital images generally used instead of photographs in satellite remote sensing?

a. Digital image data can be beamed back electronically from space.

b. Digital images are similar to a mosaic, made up of grid cells that form a picture.

c. Digital images can reproduce a wider part of the spectrum than photos can.

d. Digital image data can be beamed back electronically from space, and they can

reproduce a wider part of the spectrum than photos can.

25. A great circle:

a. cuts Earth into two hemispheres

b. is an exact circumference of Earth

c. provides the shortest routes of travel on Earth's surface

d. all of these

26. Persons traveling west across the International Date Line must:

a. turn the calendar back one day

b. turn the calendar ahead one day

c. turn his watch 12 hours ahead

d. turn his watch 12 hours back

27. Which of the following is NOT a benefit of a geographic information system?

a. A GIS can store and display of many combinations of mapped data layers.

b. A GIS can adjust data on different map scales and projections to fit one map.

c. A GIS can be used to analyze the spatial distributions of environmental, natural, and

human features.

d. All of these are benefits that a GIS can provide.

28. Mercator maps show the greatest amount of distortion in the:

a. polar region

b. middle latitudes

c. equatorial region

d. Distortion is distributed evenly throughout the map.

29. The time of day when the sun reaches its highest position in the sky is called:

a. noon in the local time zone

b. solar noon

c. Zulu time

d. solar plexus

30. Which remote sensing system would provide the best image of cloud heights, as well as ocean currents and volcanic hot spots?

a. near-infrared photography

b. weather (Doppler) radar

c. imaging radar

d. thermal infrared scanning

**True-False**

1. Longitude is measured in the same units as latitude.

True False

1. Remote sensing is the collection of information and data about distant objects or  
   environments.

True False

1. A representative fraction (RF) scale on a map must be expressed in some unit of  
   measurement.

True False

1. With the assistance of powerful super computers, modern-day small-scale maps of Earth can now be made that are distortion free.

True False

1. Latitude determines a point's location north or south of the equator.

True False

1. Near-infrared energy is the same as heat energy.

True False

1. Of all the regions of the U.S., the landscapes of the West and Midwest have been affected the least by the Public Lands Survey System.

True False

1. The magnetic poles of Earth are quite distant from the geographic poles.

True False

1. Until about 125 years ago, each town or area went by "local time" determined by  
   shadows cast by the sun.

True False

1. One characteristic of a "great circle" is that it must pass through both the north and south poles.

True False

1. The Global Positioning System (GPS) uses a network of satellites to accurately determine  
   one's location on Earth's surface.

True False

**Fill-in-the-Blank**

1. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the arbitrary starting point for longitude measurement.
2. The time difference between Chicago and Greenwich, England is \_\_\_\_\_\_ hours (include plus or minus hours).
3. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ refers to the relationship between distances on Earth to distances on the map.
4. A key that explains symbols used on a map is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
5. Maps that do maintain true shape of small areas are said to be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
6. The angular difference between true north and magnetic north is called \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
7. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system of direction is given in degrees of a circle with respect to north and is used for military and navigational purposes.
8. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is used as the starting point for measuring latitude.
9. In the Public Land Survey System, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ defines a point east or west of a principal meridian and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ defines a point north or south of a base line.
10. An aerial photograph taken at an acute angle to Earth’s surface is known as a(n) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ image.

**Essay**

1. How is a holistic view useful in dealing with a problem that concerns human-environmental interactions? Explain with a specific example.
2. Explain conformal, equal-area, and compromise world maps in terms of their advantages and drawbacks. What are some of the applications for each kind?
3. How are computers, remote sensing imagery, and GIS used to increase our ability to analyze spatial information, data, distributions, and relationships? Explain with a specific example.

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**Question one**

1. Define the following terms:

* Spatial database – Geoids – Datum- Spaghetti Data structure- Topological data structures.

2- Menoufiya governorate is planning a new park in shabin Elkom. You are hired as a planner to .identify possible sites for this future park in an area that is experiencing population growth while also trying to preserve the prime agricultural land of the county. You are given the following guidelines. The park must be:

1. Within 16 kilometers of a city population greater than 10,000.
2. On land that is not zoned as Agricultural, Industrial, Commercial or Conservation.
3. On land that is currently Vacant.
4. On land that does not contain an endangered species.
5. On slopes greater than 2.5% (to provide topographic relief for hiking trails as well as scenic beauty).
6. On land that is accessible from an existing road.

Finally the park area must be at least 40000 Square meters.

Write down what data sets (data layers, data themes) are likely to be needed for such a project and whether they should be vector or raster. Also give two scenarios that indicate How this spatial query can be executed

3-Compare the characteristics of the raster and vector data models; specifically address the spatial and attribute components.

**Question Two**

1- Reconstruct an image from the following Quadtree (N is north, W is west, E is east and S is south)

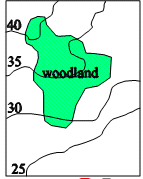


2- Describe Two examples of earth Modeling

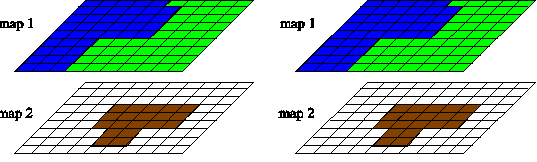
3- What is/is not a GIS? What are the major components of a GIS?

4-Define the terms *ellipsoid* and *geoid*

**Question Three**



1- If the shaded area is the Woodland and the line represents the height of land which varies from 40 to 25. Find the following: Woodland OR land over 30 meters-Woodland AND land over 30- Woodland Not over 30 and Woodland XOR over 30.



2 - Find the resulted map from the above figure if map 1(two colors levels) and map 2 (one color level) will be updated or clipped.

3- Describe and explain the components for the following two global coordinate systems:

a. Geodetic (Latitude, Longitude, Height)

b- Universal Transverse Mercator (UTM)

4- Calculate the length of the sector of the equator in UTM coordinates system Assume a spherical earth model with radius 6370 km.

**Question Four**

1-What is the length of  increment on a meridian on a parallel at 30 N, 90 W. Consider that the earth is ideal sphere is radius is 6370 km .

2- What are the differences between GPS and DGPS?

3- Represent the following map as a quadtree as:

|  |  |  |  |
| --- | --- | --- | --- |
| 127 | 127 | 3 | 3 |
| 127 | 4 | 3 | 3 |
| 1 | 1 | 1 | 1 |
| 255 | 255 | 255 | 255 |

.



1. (b)

4- At the above figure if the X-axis represent the lightening level and Y-axis represent the frequency , Define the operation which can be used to convert from figure a to figure b.

5- Differentiate spatial and non-spatial data; provide several examples for each.

6- Give four types of satellite according to distance earth surface and satellite orbit? Give the type and height of Nile Sat.

**Question Four**

**Give True/False Section:**

1. Geographic information system, GIS, provides producers with the tools necessary to make timely decisions.
2. GIS allows a producer to relate information about many different cropping factors.
3. GIS source data is still meaningful with or without geographic location.
4. The advantage of GIS is that it is an automated decision-making system.
5. GIS supports producers through processing spatially referenced data.
6. Producers using GPS can convert fertilizer data into a map providing an additional information layer in GIS.
7. . Real-time DGPS would require a vehicle to have two receivers: GPS and differential correction receiver.
8. The NAVSTAR satellites are polar

**Multiple Choice Section:**

1. GIS (choose all that apply):
   1. A computer software that collects, sorts, maps, graphs, etc. data vital to the producer’s operation
   2. Utilizes only existing data in order to solve producer problems
   3. Helps producers use information from various sources
   4. Makes it possible to make decisions faster because the system is relatively easy to learn
2. GIS vs. Mapping Software:
   1. GIS and Mapping software may be used interchangeably because both are used to make maps
   2. GIS and mapping software are used to make maps, charts, graphs, etc.
   3. GIS can perform analysis that mapping software cannot do
   4. None of the above
3. Abilities of GIS:
   1. Emphasizes spatial relationships among objects being mapped
   2. Displays a tile line as a simple line
   3. Recognizes where the tile line is located
   4. All of the above
4. Abilities of Mapping (choose all that apply):
   1. Allows the user to overlay a yield map with another layer
   2. Highlights areas on the yield and soil map with specific characteristics so producer does not have to visually relate the data
   3. Displays data for variables that do not fluctuate from season to season
   4. Performs analysis for the producer
5. GIS:
   1. GIS is an automated decision-making system
   2. Requires data
   3. Is used to combine both vector-based digital data and raster-based data files
   4. B and C
6. Developing Information Databases:
   1. GIS makes it possible to analyze information that is difficult to associate by other methods.
   2. GIS uses combinations of mapping variables to analyze new variables
   3. GIS makes it possible to simulate the amount of chemical that might drift onto a neighbor’s field
   4. All of the above
7. Data Storage Options:
   1. Database management system, DBMS is the best solution to for storing, organizing, and managing data where large data volumes are involved
   2. To use a DBMS not separate from the GIS, the file must contain spatial data that relates its stored data to specific locations in the field
   3. Linear databases are the most useful DBMS for a GIS because it stores data as a collection of tables with common fields in different tables that are linked together
   4. None of the above
8. GIS:
   1. Knowledge of the field usually prevents data entry errors
   2. Data from various sources may not align in the correct data field
   3. Credibility of the source of the data is important
   4. All of the above
9. Effective GIS can:
   1. Improve yields
   2. Lower production costs
   3. Provide the information necessary to precisely micro-manage every step of the farming process if economically advantageous
   4. All of the above
10. Time:
    1. GIS does not require specialized training
    2. GIS does require continuous use of the program to generate desired maps
    3. GIS is a simple system to learn but its takes some time to perfect
    4. All of the above
11. Specifically, how does the GPS system enable the calculation of distance between satellites and ground receivers? By sending:

a. passive radiation encoded geo-registered coordinates

b. an encoded radio message transmitted synchronously.

d. passive radiation encoded encryption of time

1. Which of the following three types of errors associated with knowing one’s position is most strongly associated with errors in positions determined by GPS? Circle one.

a. coordinate resolution

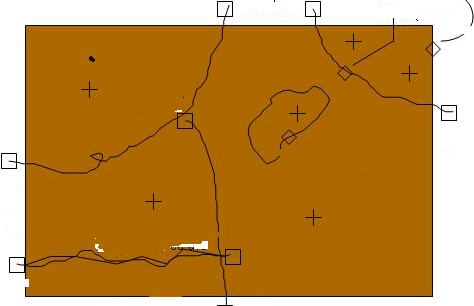
b. atmospheric interference c. wavelength saturation

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1. Consider the following sketch of polygon-arc topology, and fill out the table that follows (polygons are indicated by boxed numbers, arcs by unboxed numbers, Indicate your numbers for nodes).



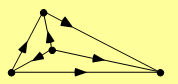
**Question one**

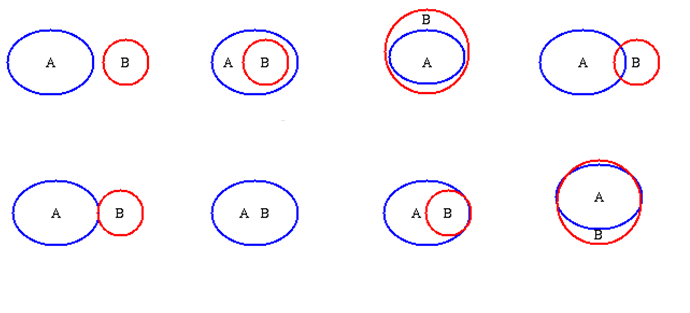
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1- Find the topological errors in the above map, and then redraw the corrected one



**Represent the following figure in Spagitte and in Arc-node**

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**-**

**5- For the above figure write the name of each spatial relation**

**Question Two**

Complete the following

* 1. …………… - “1” dimensional. Length, but No Width. Must have a beginning and an ending point.
  2. -----------The most accurate, most complex model of the Earth, taking into account the Earth’s minor variations from an ellipsoid
  3. -------------- tells you what it is.
  4. Features must be referenced to some real world location Known as …………… ……..
  5. ----------are a set of connecting lines
  6. ---------------A more accurate model that takes into account some of the Earth’s irregularity

1. -------------represented by points, lines, and polygons
2. -------------is a static map
3. -----------tells you where it is
4. …………… means of storing, retrieving, sorting, and comparing spatial data
5. Translating the Earth (3D) to a flat map (2D)
6. Lines are called parallels--------------
7. ----------do not provide precise locational information because space is divided into discrete grid cells.
8. -----------… - “0” dimensionality. No length or Width.
9. ----------describes both geospatial and attribute data
10. -----------is a branch of mathematics dealing with the shape and area of the earth or large portions of it.
11. ------------The simplest 3D model of the earth
12. --------------The information that ties an ellipsoid model to a known place on the Earth
13. --------------Lines are called meridians

**Choose the correct answer**

1. **Which of the following is not an analysis method**
   1. Temporal Analysis
   2. Meta Data Analysis
   3. Statistical Analysis
   4. Proximity Analysis
2. **Consider opening a new branch for a bank, Which analysis method would you use to determine nearest banks to your new branch**
   1. Overlay
   2. Proximity
   3. Statistical
   4. Temporal
3. **Which of the following is not part of analysis workflow**
   1. Frame the question
   2. Choose methods and tools
   3. Examine and Refine the results
   4. Publish the data
4. **What is proximity analysis?**
   1. Buffer zones around hospitals
   2. Temporal Variance of pH levels measured and analyzed at one location each year
   3. Population data over 5 years
   4. Amount of crimes last year
5. **Which of the following is one of proximity methods**
   1. Buffer
   2. Mask
   3. Vectorization
   4. Overlay
6. **By ‘spatial data’ we mean data that has**
   1. Complex values
   2. Positional values
   3. Graphic values
   4. Decimal values
7. **. ‘Spatial databases’ are also known as**
   1. Geodatabases
   2. Monodatabases
   3. Concurrent databases
   4. None of the above
8. **Successful spatial analysis needs**
   1. Appropriate software
   2. Appropriate hardware
   3. Competent user
   4. All of the above
9. **The following are the examples of ‘geographic fields’**
   1. Air temperature
   2. Barometric pressure
   3. Elevation
   4. All of the above
10. **Which of the following statements is true about the capabilities of GIS**
    1. Data capture and preparation
    2. Data management, including storage and maintenance
    3. Data manipulation and analysis
    4. Data presentation
    5. All of the above
11. **What Kind of analysis use that questions “What do geographic patterns tells us?”**

A- Proximity B- Overlay

C- Statistical D- Temporal

1. **A small chain of stores needs to add a new store to increase sales and attract new customers. Which analysis method shall they use?**
   1. Temporal Analysis
   2. Proximity Analysis
   3. Statistical Analysis
   4. None of the above
2. **. What is ‘Metadata’?**
   1. It is ‘ data about data’
   2. It is ‘meteorological data’
   3. It is ‘oceanic data’
   4. It is ‘contour data’
3. **Which Analysis method determine what changes has occurred over time?**
   1. Temporal Analysis
   2. Proximity Analysis
   3. Statistical Analysis
   4. Overlay Analysis
4. **You are evaluating a new product sales percentage what is the analysis method you would use?**
   1. Overlay Analysis
   2. Proximity Analysis
   3. Statistical Analysis
   4. None of the above
5. **What tells us if there are patterns in the data to support your conclusions?**
   1. Hot or cold spots
   2. Nearby
   3. Mask
   4. Overlay
6. **How do GIS tools measure proximity?**
   1. Least cost Path
   2. Euclidian Distance
   3. Geodetic
   4. All of the Above
7. **Which streets are in Tornado Path? Can be answered using:**
   1. Overlay Analysis
   2. Raster Data model
   3. Proximity Analysis
   4. None of the above
8. **Overlay techniques are :**
   1. Union
   2. Intersect
   3. Identity
   4. All of the above
9. **What is true for Binary Overlay Analysis**
   1. Cells are either good or bad
   2. Layers are weighted
   3. Cell values are ranked onto common scale
   4. All of the Above

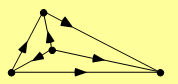
**Question Two**

1- Define the following terms:

* Photogrammetric – Geoids – VSAT - MEO- LEO - Topological data structures.

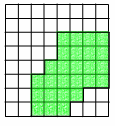
2-Compare the characteristics of the raster and vector data models; specifically address the spatial and attribute components.

3- What are the types of resolution in remote sensing applications?



**Question Three**

1. Represent the following map in Quadtree data structure



2- Describe Two examples of earth Modeling

3- What are the seven elements in remote sensing systems?

**Question Three**

1- Give reason for the following

- Egyptian satellite Nile sat is GEO

- Projection only in GIS should be based on cylinder, Cone or plan

- There is leap year every four years

- Arc node data structure is an improvement of in Seagate data structure

2- Describe and explain the components for the following two global coordinatesystems:

a. Geodetic (Latitude, Longitude, Height)

b- Universal TransversaMercator (UTM)

3- Calculate the length of the sector of the equator in UTM coordinates system Assume a spherical earth model with radius 6370 km.

4- Give two definitions of Ontology ?

**Question Four**.

1- What are the sources of errors in GPS systems?

2- Explain the role of Atomic clock in GPS

3- What are the differences between GPS and DGPS?

4- Give two old methods of measuring earth diameter before Satellites?

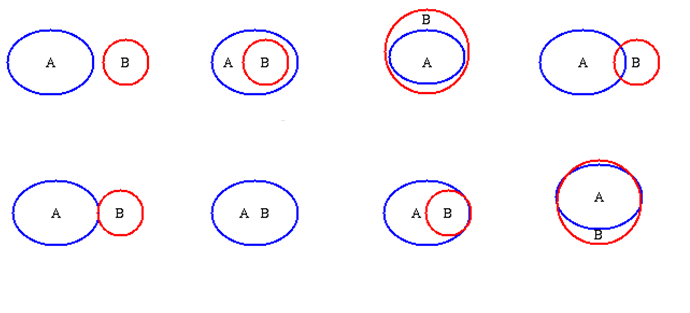
**Question Five**

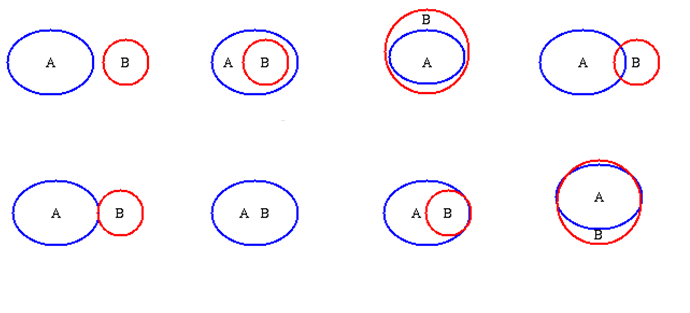
1-Draw Mobile GIS Architecture?

2-There is **a trade-off** between **spatial resolution** and **data storage** when we use the raster datamodel,

Compare the different in the following two cases according to **data storage**

* + 60 km satellite image with 10m cellsize
  + 60 km satellite image with 100m cellsize



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**3-For the above figure write the name of each spatial relation**

**4-**

