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Part A

- 1) Illustrate the Boolean **.AND.** operation for **Map A equal to 1; Map B equal to C** Answer in the **RESULT 1** layer

1	2	1	0	0
1	2	1	0	0
1	0	2	2	0
0	0	2	2	1
0	1	2	2	2

Map A

C	C	A	A	A
B	B	B	A	A
B	C	C	C	C
B	A	A	A	C
C	C	C	B	B

Map B

RESULT 1

- 2) Illustrate a Boolean **.OR.** operation for **Map D = 0 : Map E = B** in the **RESULT 2** layer

1	2	1	0	0
1	2	1	0	0
1	0	2	2	0
0	0	2	2	1
0	1	2	2	2

Map D

C	C	A	A	A
B	B	B	A	A
B	C	C	C	C
B	A	A	A	C
C	C	C	B	B

Map E

RESULT 2

MULTIPLE CHOICE (Circle the correct response)

- 3) Map algebra is:
- a) Operations on coregistered map layers with rasters of identical size, resolution and orientation.
 - b) The process of entering data into GIS
 - c) A type of GIS data model
 - d) A commercial GIS vendor
 - e) Provides excellent representation of objects in the landscape.
- 4) An area digitized in a vector GIS is a _____ object.
- a) One dimensional
 - b) Two dimensional
 - c) Three dimensional
 - d) b or c, depending if the coverage is complex or simple
 - e) None of the above
- 5) Given a raster data set that covers an area 8 km by 8 km, with a spatial resolution of 4 meters, how many rows does the image have?
- a) 10
 - b) 100
 - c) 80
 - d) 800
 - e) 1000
 - f) 2000
- 6) Which of the following statements is FALSE?
- a) Node and point objects have the same dimension in GIS.
 - b) Nodes and vertices define an arc.
 - c) Scale is a representative fraction; defined as the ratio of the ground distance over the distance on the map
 - d) One rule for assigning value to a raster cell is called "plurality."
 - e) Details about within-cell variation is not preserved in raster representation

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- 7) The map projection that preserves all the geometric qualities of area, shape and direction.
- Mercator
 - Lambert's Conical
 - UTM
 - Alber's Equal Area
 - All of the above
 - No map projection preserves all geometric properties.
- 8) With reference to a raster data model, spatial resolution is defined in terms of:
- The ground area of a single pixel.
 - The ground length of the typical feature.
 - The map length of a single pixel side.
 - The ground distance of a single pixel side.
 - The map length of the smallest feature.
- 9) Identify the correct statement relating to the **OBJECT** view of data:
- Represents the world as a finite number of variables, each one defined at every possible position.
 - Distinguished by dimensions and naturally falls into categories of points, lines and areas.
 - The number of pixels in a field depends on the scale of resolution.
 - Objects have ill-defined and incomplete boundaries.
 - None of the above is a correct statement.
- 10) "Spatial data" are defined as having two components
- Arc Toolbox and Arc Catalog
 - Geoids and ellipsoids
 - Rasters and vectors
 - Location and attributes
 - Maps and images
- 11) "Topology" is:
- The attributes of the features of a map.
 - The surface features of the earth
 - The graphical representation of lines
 - The study of the shape of the Earth
 - GIS implementation of the spatial relationships between points, line and polygons.
- 12) The vector data model is best for storing and analyzing
- Polygon and line features
 - Hydrology – rivers and streams
 - Land parcel boundaries
 - Highway networks
 - Contour lines
 - All of the above
- 13) Cartesian coordinates are
- Attributes used to describe the characteristics of geographic features
 - The basis of raster data
 - Models of the shape of the Earth used in geodesy.
 - Used to identify the location of an object in a plane or a volume.
 - The lines of latitude and longitude
- 14) If a wall 10,000 feet long is shown on a map with a line 0.5 inch long, what is the scale of the map?
- 1:1000
 - 1:5000
 - 1:24,000
 - 1:10,000
 - 1:100,000
 - 1:240,000
- 15) A measurement, value or quality of a geographic feature is called a(n):
- GIS
 - Attribute
 - Spatial data
 - Line feature
 - Isopleth map
- 16) The binary number 0 0 1 0 1 0 1 0 represents the decimal value:
- 41
 - 42
 - 200
 - 20
 - 23
- 17) The smallest element of a raster is called
- Area
 - Zone

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- c) Map layer
d) Patch
e) Grid cell
- 18) Metadata are
a) Data about data
b) Spatial data
c) Irrelevant
d) Irreverent
e) Optional in NSDI
- 19) One advantage of raster data is:
a) They can be used as a background for digitizing and editing in GIS.
b) Raster files are generally small and take up little storage space in the computer
c) Provide excellent representation of the objects in the landscape.
d) All of the above
e) There is no advantage in using raster data.
- 20) A high resolution satellite image is stored as
a
a) Digital Orthophotograph
b) Digital Line Graph (DLG)
c) Digital Clock
d) Raster array of data
e) Single layer of topologically correct vector data
- 21) The decimal number 31 is represented in binary as
a) 0 0 0 0 0 0 0 1
b) 1 0 0 0 0 0 0 1
c) 1 1 1 1 1 1 1 1
d) 0 0 0 0 1 1 1 1
e) 0 0 0 1.1 1 1 1
- 22) The smallest linear distance which can be recorded in a GIS determines the
a) Orientation
b) Spatial resolution
c) Map layer
d) Spatial revolution
e) Raster extent
- 23) Reclass is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 24) Slope calculation is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 25) Area is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 26) Boolean overlay is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 27) Nearest distance (shortest path) is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 28) Buffer is a raster operation of which class?
a) Local
b) Local Neighborhood
c) Extended Neighborhood
d) Zone
- 29) A Boolean AND operation is the same as an arithmetic PLUS operation
a) True
b) False
- 30) A Boolean OR operation is the same as an arithmetic multiplication operation
a) True
b) False