Sheet

1. **What is GIS?**

**Answer :**

An organized collection of computer hardware, software, geographic data, and personnel designed to efficiently capture, store, retrieve, update, manipulate, analyze and display information which are spatially referenced to the Earth.

1. **What is the function of the following ARCMAP tools: (ملغي)**

**Answer :**

**Identify Tool :** used to display the attribute data of specified feature.

**Select Feature Tool :** use to select a specified feature in a specified layer.

**Statistics Command :** used to maintain some statistics about an attribute on the specified layer such as, maximum and minimum value for this attribute, summation of the all attribute values, there average and standard deviation value.

**Full Extent :** Allows you to zoom to the full extent of your map.

**Select Elements :**  Allows you to select, resize, and move text, graphics, and other objects placed on the map.

**Zoom In in Data View :** Allows you to zoom in to a geographic window by clicking a point or dragging a box.

**Zoom In in Layout View :** Allows you to zoom in on your layout by clicking a point or dragging a box.

**Zoom Out :** Allows you to zoom out from a geographic window by clicking a point or dragging a box.

**Pan :** Allows you to pan the data frame.

**Fixed Zoom In :** Allows you to zoom in on the center of your data frame.

**Fixed Zoom Out :** Allows you to zoom out on the center of your data frame.

**Back :** Allows you to go back to the previous extent.

**Forward :** Allows you to go forward to the next extent.

**Clear Selection :** Unselects all the currently selected features in the active data frame.

**Clip features:** Use Clip when you want to cut out a piece of one layer using one or more of the polygons in another layer as a 'cookie cutter'. This is particularly useful for creating a new layer that contains a geographic subset of the features in another larger layer.

**Overly: there are two types of overlaying,**

* **Intersect overlay:** Use Intersect when you want to overlay a layer with the polygons in another layer so that the resulting output layer has the combined attribute data of the features in the two inputs, (a and b) only contains features that fall within the spatial extent of the overlay polygons.
* **Union overlay:** Use Union when you want to overlay two polygon layers so that the resulting output layer has the combined attribute data of the polygons in the two inputs, (a and b) contains all the polygons from the inputs, whether or not they overlap. In this way, you can produce a new layer combining the features and attributes of two polygon layers.

**3-What are the five components of a GIS?**

**Answer**

People: computer stuff, such as, experts, GIS operators, GIS experts, application developers.

Data: may be spatial, attribute, temporal data.

Hardware: including hard disks, computers, GPS, disks, digitizer, plotters, and communication devices.

Software: operating systems, ARC GIS, ARC VIEW, ARC INFO, or any CAD software.

Analysis: queries and the required tasks user needs or asks the GIS system about its answers.

**4-Discuss the application areas of GIS?**

**Answer**

* + Natural resources management:
    1. Wildlife habitat
    2. Flood plains
    3. Agricultural lands
  + Facilities management:
    1. Locating underground pipes and planning
    2. Balancing loads in electronic networks
    3. Planning facility maintenance
    4. Tracking energy use
  + Land management:
    1. Land acquisition
    2. Maintenance of ownership
  + Street-networks:
    1. Address matching
    2. Locating analysis or site selection

**5-What is the meaning of Georeferancing?**

**Answer**

the process of converting from system coordinate (x, y) to real-world coor using control points (establishing a relation between the data displayed in the GIS software and real world coordinates)

**6-Explain how to Insert the data into Arc Map GIS?**

**Answer**

1. Make sure a map or scene is your active view
2. On the Map tab , in the Layer group, click Add Data
3. Browse to or search for the dataset you want to add to your map
4. Click the dataset or select many datasets to add to them to the map
5. Click OK

**7-Explain how to Georeferancing your GIS layer or map using ARCGIS?**

**Answer**

**Step1:** identifying our control points on the map

**Step2:** get the real world coordinate of our control points by using GPS or an electronic map (Google earth)

**Step3:** converting this coordinates from DMS to decimal to be ready to enter to computer.

**Step4:** open ARCMAP, and use ADD DATA button to add our map to the application

**Step5:** display the Georeferancing tool from view menu, toolbars, Georeferancing

**Step6:** zoom to the first control point location, and click on the add control point button, then click to add the first one, right click to input x and ycoordinate for this point (x=longitude, y=latitude).

**Step7**: repeat step6 for all control points.

**Step8:** from Georeferancing toolbar click on Georeferancing menu andchoose rectify to generate the rectified map.

**8-How to rectify image in Arc Map GIS?**

**Answer**

### **Step 1: Upload files**

### **Step 2: Orienting the image to fit the map**

### **Step 3: Adding Control Points**

### **Step 4: Rectify**

### **Step 5: Checking your new map layer**

**9-Explain how to create shapefile called Polygones using ARCCATALOG?**

**Answer**

1. From Arc Cataloge
2. Right Click, point to New, then click Shapefile.
3. Click in the Name text box and type a name for the new shapefile (**Polygones**)
4. Click the Feature Type drop-down arrow and click the type of geometry the shapefile will contain.
5. Click **Edit** to define the shapefile's coordinate system
6. Select, import, or define a new coordinate system.
7. Click **OK**

**10-Explain how to create shapefile called Polylines using ARCCATALOG?**

**Answer**

1. From Arc Cataloge
2. Right Click, point to New, then click Shapefile.
3. Click in the Name text box and type a name for the new shapefile (**Polylines**)
4. Click the Feature Type drop-down arrow and click the type of geometry the shapefile will contain.
5. Click **Edit** to define the shapefile's coordinate system
6. Select, import, or define a new coordinate system.
7. Click **OK**
8. If the shapefile will store polylines representing routes, check **Coordinates will contain M values**.

**11-Explain how to Edit shapefile in ARCGIS?**

**Answer**

1. From Arc Cataloge
2. Right Click, point to New, then click Shapefile.
3. Click in the Name text box and type a name for the new shapefile
4. Click the Feature Type drop-down arrow and click the type of geometry the shapefile will contain.
5. Click **Edit** to define the shapefile's coordinate system
6. Select, import, or define a new coordinate system.
7. Click Ok

**12-Explain how to create shapefile called Points using ARCCATALOG?**

**Answer**

1. From Arc Cataloge
2. Right Click, point to New, then click Shapefile.
3. Click in the Name text box and type a name for the new shapefile (**Points**)
4. Click the Feature Type drop-down arrow and click the type of geometry the shapefile will contain.
5. Click **Edit** to define the shapefile's coordinate system
6. Select, import, or define a new coordinate system.
7. Click **OK**

**13-Compare between Georeferencing && Projection ?**

**Answer**

**Georeferancing:** the process of converting from system coordinate (x, y) to real-world coor using control points (establishing a relation between the data displayed in the GIS software and real world coordinates)

**Projection:** the process of transforming from 2D (on screen) map to 3D curved surface on the earth by specifying the geographic coordinate systems and projection coordinate systems.

**14-Compare between Onscreen digitizing technique && Digitizing table ?**

**Answer**

**Onscreen digitizing technique**: is the process of tracing the features from a scanned map or an image to create a new layers or themes. In technique we use a mouse and a monitor rather than using a digitizer and table. This is easier than digitizing table and more accuracy .

**Digitizing table technique:** is a table consist of a fine wire embedded on the surface of the table ready to be moved over the map, a digitizer by which we trace the map to digitize it. The digitizer have a function for every process button for recoding current x,y of the map, button for capturing intersections between lines, so on.

**15-Explain how to use Onscreen digitizing technique (based on polygons) using ARCMAP?**

**Answer**

1. **Create shapefile**
2. **Open editor**
3. **Create features (polygons)**
4. **Do what yo do**
5. **Save edit**
6. **End editor**

16-Explain how to u se Onscreen digitizing technique (based on polylines) using ARCMAP?

**Answer**

1. **Create shapefile**
2. **Open editor**
3. **Create features (polylines)**
4. **Do what yo do**
5. **Save edit**
6. **End editor**

**17-Explain how to use Onscreen digitizing technique (based on points) using ARCMAP?**

**Answer**

1. **Create shapefile**
2. **Open editor**
3. **Create features (point)**
4. **Do what yo do**
5. **Save edit**
6. **End editor**

**18-Compare between Spatial data && Aspatial data ?**

**Answer**

**Spatial data**: represents features that have a known location on earth, such as, a hospital building

**Aspatial data** (attribute data): the information linked to the geographic features (spatial data) that describe these features, such as, the hospital name, number of doctors and nurses worked in this hospital.

**19-Compare between Raster data && Vector data ?**

**Answer**

|  |  |
| --- | --- |
| **Raster data** | **Vector data** |
| Raster data structure uses a series of equal-sized cells called pixels. | Vector data structure is point , lines, and polygons |
| Location and attribute data stored in one table | Location and attribute stored in separate tables |
| No topological information | Topological information recorded |
| Data structure simple | Data structure complex |
| Resolution limited by pixel size | In theory, unlimited resolution |
| Low geometrical accuracy | High geometrical accuracy |
| Network analysis poor | Network analysis good |

**20-How to add a field in attribute table in ARCMAP?**

**Answer**

**Step1:** Right click on the layer name on the table of content, then choose open attribute table from the raising menu.

**Step2:** In the attribute table window, click on options button and choose add field.

**Step3:** Add field windows will be displayed, enter the field name, field type and field length, then click ok to add a new field to the layer attribute table.

**21-How do you access a layer's attribute table in ARCMAP?**

**Answer**

Right click on the layer name on the table of content, then choose open attribute table from the raising menu.

**22-Compare between Point mode && Streaming mode?**

**Answer**

**Point mode:** a new vertex will not be added until you press the cursor button once, then move the pointing device to a new point element and repeat the process. This mode is useful for individual locations as well as for straight lines that only require a few points to be digitized.

**Streaming mode:** After pressing a button to begin the data collection, the digitizer continually collects points as the cursor is moved along a linear feature, until the operator presses another button to end digitizing**.** This mode is useful for curved lines.

**23-Compare between Dangle node && Pseudo node ?**

**Answer**

**Dangle node:** Arc endpoint that is not connected. There are two types of dangles:

**Overshoot dangle node**: node is covered its limit that is should to be.

**Undershoot dangle node:** node doesn't reached or achieved its limit**.**

**Pseudo node:** a point on an arc that connects to itself. Normally, pseudo nodes are not considered as errors (in polygon layers)

**24-Compare between True node && Vertex ?**

**Answer**

**True node**: a point that represents an intersection of 3 or more arcs**,** also represent the start and end node of an arc

**Vertex**: line intermediate points.

**25-Explain how to Use “SELECT” toll in Arc GIS?**

**Answer**

# 26-Answer with True or False and correct the false statement:

# 1-Start editing is needed to add a field in the attribute table.

**Answer** (FALSE)

stop editing is needed to add a field in the attribute table.

2-**When you are editing, you alter the source data.**

**Answer** (FALSE)

you alter the source data when you are saving you're editing.

**3-You can add a field to attribute table in ARCCATALOG while the table is opened in ARCMAP.**

**Answer** (FALSE)

you can add a field to attribute table in ARCCATALOG, only if the table is not accessed by anther application (ARCMAP, MS ACCESS).

**4-Projection information for a shape file is stored in an x.dbf file.**

**Answer** (FALSE)

Projection information for a shape file is stored in an x.prj file.

**5-The vector storage uses a series of equal-sized cells.**

**Answer** (FALSE)

the raster storage uses a series of equal-sized cells.

**6-You can group points and lines into the same feature class.**

**Answer** (FALSE)

feature class can contain only one feature type (points/polygons, or lines), but feature dataset can contain several feature classes with several feature types.

**7-You can group points and lines into the same shape file.**

**Answer** (FALSE)

shape file contains only one feature date type.

**8-A shape file is a folder containing feature classes.**

**Answer** (FALSE)

a feature dataset is a folder containing feature classes.

**9-It is not necessary to define the type of the feature when you create a new shape file.**

**Answer** (FALSE)

you can not create a new shape file without defining its feature data type.

**10-Edit and clean is not important for a point shape file.**

**Answer** (TRUE).

**11-You can undo the wrong actions in ARCMAP.**

**Answer** (TRUE).

**12-Dangle node is considered an error in line shape file.**

**Answer** (FALSE)

Dangle node is considered an error in polygon shape file.

**13-GPS instrument is used to get the control points coordinates in meters.**

**Answer** (FALSE)

GPS instrument is used to get the control points coordinates in degree minutes second.

**14-Pseudo node is considered an error in a polygon shape file.**

**Answer** (FALSE)

Pseudo node is considered an error in a line shape file.

**15-Tabular data can be both input and output of GIS.**

**Answer** (TRUE).

**16-There is no spatial relationship between points, lines, and polygons in topological data.**

**Answer** (FALSE)

there is no spatial relationship between points, lines, and polygons in spaghetti data.

**17-Each field should have a unique name.**

**Answer** (TRUE).

**18-Vector data is always more accurate than raster data.**

**Answer** (TRUE).

**19-Before you can edit a feature, you must first select it with the sketch tool.**

**Answer** (FALSE)

before you can edit a feature, you must first select it with the edit tool.

**20-You can save your edits while editing or at the end of the edit session.**

**Answer** (TRUE).

**21-Select feature tool is used to display the attribute data for a specified feature.**

**Answer** (FALSE)

identify feature tool is used to display the attribute data for a specified feature.

**27-which of the following considered an error, and if it is, how to correct it:**

**- You have many pseudo nodes in polygon layer.**

**Answer** it is normal to find pseudo nodes in polygon layer.

- **You forgot to make clean for a point layer.**

**Answer** it is not an error because point layer does not need to clean.

**- A polygon feature has no label point.**

**Answer** it is an error, and we must modify this polygon with a label point.

**- You have many dangling nodes in a line layer.**

**Answer** dangle nodes in line layer does not considered an error, but if it does not represent an actual ends for lines, then it represents an error and can be Corrected by modifying the undershoot dangle to reach the appropriate intersection or by trim the unwanted overshoot dangles.

- **Same features IDs are set to zero.**

**Answer** it is considered as an error, that can be corrected be selecting each feature, opening it attribute data, and entering it's ID.

- **Two polygons have the same label point IDs.**

**Answer** it is considered as an error. each feature should have a unique user ID, that means one of this polygon has assigned a wrong user ID ,to correct this select this polygon with select feature tool and open its attribute data and rewrite the correct ID.

- **There is a dangle arc between two polygons.**

**Answer** it is considered as an error, its correction depends on the type of the dangle node.

**28-How to add a field in attribute table in ARCCATALOG?**

**Answer:**

**Step1:** right click on the layer name on the arccatalog; choose properties from the raising menu.

**Step2:** choose fields tab, click on the field name column to add the new field name, and then click on the field type column to enter the new field type then click ok to add this field

**29-How to add Title of the map using ARCMAP?**

**Answer:**

1. from insert , click title
2. type title you want , and click Ok
3. put it where you want

**30-How to add Scale Bar of the map using ARCMAP?**

**Answer:**

1. from insert , click Scale bar
2. choose the Scale
3. put it where you want

**31-How to add North Arrow of the map using ARCMAP?**

**Answer**

1. from insert , click North Arrow
2. Select the shap you want
3. put it where you want

**32-How to add Legend of the map using ARCMAP?**

**Answer**

1. from insert , click legend
2. add records what you want , click next

**33-How to add the Grids of the map using ARCMAP?**

**Answer**

1. right click on Data Frame
2. select properties
3. select the grids tab
4. Add New Grid
5. Choose what type of grid you wish to create
6. Select format what you want
7. Click Ok

**35-How to add the Unique Values of the map using ARCMAP?**

**Answer**

1. Right-click on the layer and click **Properties**. Click the **Symbology** tab on the **Layer Properties** dialog box.
2. Choose the **Unique values** option under **Categories** in the left-hand renderer list
3. Select the field containing the categories.
4. Click **Add All Values** or **Add Values** to identify the categories you want to display. **Add Values** allows you to select a subset of the field values to include as categories in your layer display.
5. Identify the symbology you want to use to display your categories. Do this by right-clicking the symbol for each category to modify its symbol properties or to choose another symbol.

**37-How to add the Categories from the type of Unique values with many fields of the map using ARCMAP?**

**Answer**

1. Right-click on the layer and click **Properties**. Click the **Symbology** tab on the **Layer Properties** dialog box.
2. Choose the **Unique values, many fields** option under **Categories** in the left-hand renderer list.
3. Select up to three fields to define the categories.
4. Click **Add All Values** or **Add Values** to identify the categories you want to display. The fields designate a series of unique field value combinations that define your layer categories. **Add Values** allows you to select a subset of the field value combinations to include as categories in your layer display.
5. Identify the symbology you want to use to display your categories. Right-click the symbol for each category to modify its symbol properties or to choose another symbol.

**38-How to add the Pie charts of the map using ARCMAP?**

**Answer**

1. Click the symbology tab on the layer properties dialog box
2. Select charts , pie
3. Choose fields , shape , size , colors
4. Click Ok

**39-How to add the Quantities from the type of Graduated Colors of the map using ARCMAP?**

**Answer**

1. Right-click the layer you want to draw **using graduated colors in** the table of contents and click Properties.
2. Click the Symbology tab on the Layer Properties dialog box.
3. Click **Quantities**, then click **Graduated colors**.
4. Select the numeric field that contains the quantitative data you want to **map**.

**40-How to add Graduated Symbols of the map using ARCMAP?**

**Answer**

1. Right-click the layer you want , click Properties.
2. Click the Symbology tab
3. Click **Quantities**, then click **Graduated Symbols**
4. Choose value of item you want symbolled it
5. Click Ok

**41-How to add Dot Density of the map using ARCMAP?**

**Answer**

1. Right-click the layer you want , click Properties.
2. Click the Symbology tab
3. Click **Quantities**, then click qualities Density
4. Select Items you want represent it
5. Choose color
6. Click Ok

**42-How to add the Charts of the map using ARCMAP?**

**Answer**

1. Right-click the layer you want to display **using** bar or column **charts** and click Properties.
2. Click the Symbology tab on the Layer Properties dialog box.
3. Click **Charts** and click Bar/Column.
4. Under Field Selection, click the numeric field(s) that you want to **map**.
5. Click size , choose you want
6. Click color , choose you want
7. Click Ok

**43-How to add the Bar/column charts of the map using ARCMAP?**

**Answer**

**نفس اجابه السؤال 42**

**44-How to create shapefile?**

**Answer**

1. **Open arcmap**
2. **Create new shapefile**
3. **Write name and type**
4. **Choose point or line or polygon**

**45-How to create Geodatabase ?**

**Answer**

1. **Open arc cataloge**
2. **Right click on folder**
3. **Choose new file geodatabase**
4. **Rename it**
5. **New dataset**
6. **Create feature class**
7. **Determine point , polygon , line**

**46-How to use select by location in arcmap ?**

**Answer**

1. **From selection menu**
2. **Click select by location**
3. **Mark on target layer**
4. **Determine source layer**
5. **Choose method you want**
6. **Click ok**

**47-How to use select by attributes in arcmap ?**

**Answer**

1. **From selection menu**
2. **Click select by attribute**
3. **Determine method , column**
4. **Write SQL command**
5. **Click apply**

**Links**

<http://wps.pearsoned.co.uk/ema_uk_he_heywood_intro_GIS_4/205/52596/13464714.cw/index.html>

<https://www.studocu.com/en/document/university-of-southern-queensland/geographic-information-systems/past-exams/exam-2015-questions/834496/view>

<https://electronicspost.com/multiple-choice-questions-and-answers-on-gis-geographic-information-system/>

<http://wps.pearsoned.co.uk/ema_uk_he_heywood_intro_GIS_4/205/52596/13464713.cw/index.html>