1. **Which three of the following questions may be best answered using a GIS?**

- [x] Where do certain conditions apply?
- [ ] How does a process operate?
- [x] Where is a particular feature found?
- [ ] What is the relationship between two variables?
- [x] What geographical patterns exist?

2. **Which of the following are key application disciplines for GIS?**

- [x] Transport.
- [x] Commerce and business.
- [ ] Physics and chemistry.
- [x] Environmental sciences.
- [x] Civil engineering.
- [ ] Astronomy.

3. **A GIS is 'a set of tools for collecting, storing, retrieving at will, transforming, and displaying spatial data from the real world for a particular set of purposes' is a well used definition of a GIS provided by:**

- ( ) Roger Chorley (1987).
- ( ) David Rhind (1991).
- (•) Peter Burrough (1986).
- ( ) Mike Goodchild (1997).

4. **Which of the following list is the key area of GIS functionality missed out by the above definition?**

- ( ) Mapping.
- ( ) Re-projection.
- ( ) Collation.
- (•) Analysis.

5. **Which of the following is not a key concept that is part of our definition of GIS?**

- ( ) GIS technologies include GPS and remote sensing.
- ( ) People are an important part of GIS.
- (•) GIS can be used in all areas of modern science.
- ( ) GIS includes both computer systems (hardware) and computer programs (software).

6. **Which of the following are essential components of a GIS?**

- [x] A computer with sufficient memory and processing power to run the software.
- [x] A visual display unit capable of high resolution colour graphical display as well as text.
- [x] Spatial data.
- [x] Appropriate GIS software.
- [x] Data input and output devices such as digitizers/scanners and printer/plotters.
- [ ] A fast Internet connection.

7. **Which of the following is not an example of spatial data?**

- ○ Points showing location of discrete objects.
- ◉ Times of particular events.
- ○ Lines showing the route of linear objects.
- ○ Polygons showing the area occupied by a particular land use or variable.

8. **Aronoff (1989) classifies GIS analysis procedures into which of the following?**

- ☐ Decision making and support procedures.
- ☑ Those used for storage and retrieval.
- ☑ Modelling procedures or functions for the prediction of what data might be at a different time and place.
- ☑ Constrained queries that allow the user to look at patterns in their data.
- ☐ Those used to display spatial data for end-user visualization.

9. **Spatial referencing is the process of which of the following?**

- ○ Referencing geo-relational tables.
- ○ Establishing the topology of spatial objects.
- ○ Computing the reference between items in databases.
- ◉ Combing attribute values with locational information.

10. **Geographical Information Science (GISc) can be defined as:**

- ○ the epistemological study of GIS.
- ○ the use of GIS to solve physical problems.
- ○ the application of GIS to a range of scientific disciplines.
- ◉ the science behind GIS.

11. **Performing the same analysis in two different GIS software packages will always give the same results.**

- ○ True
- ◉ False

12. **Human factors influence the success of GIS as a decision support tool.**

- ◉ True
- ○ False

13. **Reality can be represented in GIS as a series of layers or as objects.**

- ◉ True
- ○ False

14. **Attribute data are one type of spatial data.**

- ○ True
- ◉ False

Multiple choice questions

Try the multiple choice questions below to test your knowledge of this chapter.

There are two main types of MCQ: those where there is only one correct answer and those where there is more than one possible answer. For example:

Q1. What does the abbreviation "GIS" stand for?
- ◉ Geographical Information System
- ○ Geological Information System
- ○ Geographic Interpretation System
- ○ Geoscience Interpolation Software

Q2. Which of the following are GIS packages?
- ☑ ArcGIS
- ☑ MapInfo
- ☑ Idrisi32
- ☐ Netscape

Introduction to GIS

Q1. GIS stands for

1. Geographic Information System
2. Generic Information System
3. Geological Information System
4. Geographic Information Sharing

Answer : A

Q2. GIS deals with which kind of data

1. Numeric data
2. Binary data
3. Spatial data
4. Complex data

Answer : C

Q3. 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

Answer : E

Q4. By *'spatial data'* we mean data that has

1. Complex values
2. Positional values
3. Graphic values
4. Decimal values

Answer : B

Q5. What is *'Metadata'* ?

1. It is ' data about data'
2. It is 'meteorological data'
3. It is 'oceanic data'
4. It is 'contour data'

Answer : A

Q6. Key components of *'spatial data'* quality include

1. Positional accuracy
2. Temporal accuracy
3. Lineage and completeness
4. Logical consistency
5. All of the above

Answer : E

Q7. 'Spatial databases' are also known as

1. Geodatabases
2. Monodatabases
3. Concurrent databases
4. None of the above

Answer : A

Q8. Successful spatial analysis needs

1. Appropriate software
2. Appropriate hardware
3. Competent user
4. All of the above

Answer : D

Geographic Information & Spatial Data Types

Q9. Which of the following is related to GIS

1. Euclidean space
2. Ramanujan space
3. Pythagorian space
4. None of the above

Answer : A

Q10. A (geographic) field is a geographic phenomena for which, for every point in the study area

1. A value can be determined
2. A value cannot be determined
3. A value is not relevant
4. A value is missing

Answer : A

Q11. The following are the examples of 'geographic fields'

1. Air temperature
2. Barometric pressure
3. Elevation
4. All of the above

Answer : D

Q12.Which of the following statements are true?

1. Natural phenomena are usually *fields*
2. Man-made phenomena are usually *objects*
3. Both 'A' & 'B' are true
4. None of the above

Answer : C

Q13. Fields can be

1. Discrete only
2. Continuous only
3. Discrete or continuous
4. None of the above

Answer : C

Q14. Examples of 'continuous fields' are

1. Air temperature
2. Barometric pressure
3. Soil salinity
4. Elevation
5. All of the above

Answer : E

Q15. Which of the following is true about *'Discrete fields'*

1. Discrete fields divide the study space in mutually exclusive, bounded parts, with all locations in one part having the same field value
2. 'Land classification' is an example of discrete fields
3. Discrete fields make use of 'bounded' features
4. All of the above

Answer : D

Q16. Which of the following is true about *'Nominal Data Values'*

1. They are values that provide a name or identifier so that we can discriminate between different values
2. True computations cannot be done with these values
3. When the values assigned are sorted according to some set of non-overlapping categories, they are called 'categorical data'
4. All of the above

Answer : D

Q17. Which of the following is true about *'Ordinal Data Values'*

1. They are date values that can be put in some natural sequence but that do not allow any other type of computation
2. An example of Ordinal data value is classifying household income as 'low', 'average' or 'high'
3. None of the above
4. Bothe 'A' & 'B'

Answer : D

Q18. Which of the following is true about *'Internal Data Values'*

1. They are quantities, in that they allow simple forms of computation like addition & subtraction
2. They do not support multiplication or division
3. Centigrade temperatures are internal data values
4. All of the above

Answer : D

Q19. Which of the following is true about *'Ratio Data Values'*

1. They allow most, if not all, forms of arithmetic computation
2. Multiplication & division of values are possible
3. They have a natural zero value
4. Continuous fields can have ratio data values
5. All of the above

Answer : E

Q20. Which of the following is true

1. Nominal & categorical data values are referred to as *'qualitative data'*
2. Internal & Ratio data is known as *'quantitative data'*
3. Ordinal data refers to a ranking scheme or some kind of hierarchical phenomena
4. All of the above

Answer : D

Q21. Interpolation is made possible by a principle called

1. Spatial Autocorrelation
2. Spatial auto-correction
3. Thematic Autocorrelation
4. Thematic auto-correction

Answer : A

Q22. The fundamental principle which refers to the fact that locations that are closer together are more likely to have similar values than locations that are far apart, is commonly referred to as

1. Tobler's first low of Geography
2. Kepler's first law of Geography
3. Anthony's first law of Geography
4. Thompson's first law of Geography

Answer: A

Q23. A ..... is a set of regularity spaced (and contiguous) cells with associated (field) values. The associated values represent call values, not point values. This means that the value for a cell is assumed to valid for all locations within the cell

1. Crystal
2. Raster
3. Segment
4. Polygon

Answer : B

Q24. Which of the following is true

1. Tessellations partition the study space into cells & assign a value to each cell
2. A raster is a regular tessellation with square cells (by far the most commonly used)
3. Both 'A' & 'B'
4. None of the above

Answer : C

Q25. TIN stands for

1. Traffic Internet Network
2. Triangulated Irregular Network
3. Temporal Interest Network
4. Temperature Interface Node

Answer : B

Q26. Which of the following is true about *'Delaunay Triangulation'*

1. The triangles are as equilateral s they can be
2. For each triangle, the circumcircle through its anchor points does not contain any other anchor point
3. Both 'A' & 'B'
4. None of the above

Answer : C

Q27. The *'boundary model'* is sometimes also called

1. Topological data model
2. Temporal data model
3. Topological discrete model
4. Temporal discrete model

Answer : A

Q28. Which of the following relationships is correct

1. Point : (0-Simplex)
2. Line segment : (1-simplex)
3. Triangle : (2-simplex)
4. Tetrahedron : (3-simplex)
5. All of the above

Answer : E

Q29. Which of the following belong to the eight spatial relationships?

1. Disjoint, meets, equals
2. Inside, covered by
3. Contains, covers, overlaps
4. All of the above

Answer : D

Q30. Which of the following statements are true about the '*temporal dimension*'

1. Time can be measured along a 'discrete' or 'continuous' scale.
2. Valid time (or world time) is the time when an event really happened, or a string of events took place.
3. Time can be considered to be 'linear' extending from past to the present ('now'), & into the future
4. When measuring time, we speak of granularity as the precision of a time value in a GIS or database.
5. Time can be represented as 'absolute' or 'relative'
6. All of the above

Answer : F

Q31. Which of the following is true?

1. 'Fields' are geographic phenomena that occur everywhere in the study area
2. 'Objects' are geographic phenomena that occur 'sparsely' over the study area
3. Fields can eb continuous or discrete
4. Objects can be classified based on location, shape, size & orientation
5. All of the above

Answer : E

Data Management & Processing Systems

Q32. Which of the following are full-fledged GIS packages

1. ILWIS
2. GeoMedia
3. ArcGIS
4. Corp
5. All of the above

Answer : E

Q33. A GIS package cannot be called full-fledged if the following capabilities are missing

1. Data capture and preparation
2. Data storage
3. Data analysis
4. Presentation of spatial data
5. All of the above

Answer : E

Q34. SDI stands for

1. Spatial Data Interface
2. Spatial Data Infrastructure
3. Spatial Data Intention
4. Spatial Data International

Answer : B

Q35. DBMS stands for

1. Database Management System
2. Database Monitoring System
3. Database Manufacturing System
4. Database Mixing Station

Answer : A

Q36. What are the various reasons for which DBMS is used

1. A DBMS supports the storage and manipulation of very large data sets
2. A DBMS can be instructed to guard over data correctness
3. A DBMS supports the concurrent use of the same data set by many users
4. All of the above

Answer : D

Q37. Which of the following is true about DBMS

1. A DBMS provides a high-level, 'declaration query language'
2. A DBMS supports the use of a 'data model'
3. A DBMS includes 'data backup' and 'recovery' functions to ensure data availability at all times
4. A DBMS allows the control of 'data redundancy'
5. All of the above

Answer : E

Q38. A 'data model' is a language that allows the definition of

1. The 'structures' that will be used to store the base data
2. The 'integrity constraints' that the stored data has to obey at all moments in time
3. The 'computer programs' used to manipulate the data
4. All of the above

Answer : D

Q39. Which of the following statements is true

1. A table or relation is itself a collection of 'tuples' (or records)
2. Each table is a collection of tuples that are similarly shaped
3. An 'attribute' is a named field of a tuple, with which each tuple associates a value, the tuple's 'attribute value'
4. All of the above

Answer : D

Q40. Which of the following statements is true in connection with a 'tuple'

1. The set of tuples in a relation at some point in time is called the 'relational instance' at that moment
2. This tuple set is always finite
3. It is possible to count how many tuples are there
4. Only 'A' & 'B' are true
5. 'A' , 'B' & 'C' are true

Answer : E