



Semester 2 2004 Final Examination
University of South Australia

Division of Information Technology Engineering and Environment

School of Natural and Built Environments

Subject Area: GEOE

Catalogue Number: 1015 (013042)

Geographical Information Systems 2

Examination Day: Tuesday

Examination Date: 16th November 2004

Examination Time: 18.00

Length of Exam: 1.30 hrs

Examination Venue:

RAS/ROYALBANQUET

Student ID:

Student Name:

Instructions to Candidates

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Allowed time 1 hrs 30 minutes Total marks = 30

General Instructions

- 1) Attempt any five Questions from Part 1
- 2) Attempt all multiple choice questions in Part 2 and **write multiple choice answer in the brackets against each question and submit this question paper along with the answer book.**
- 3) Marks for each questions are indicated
- 4) Ensure that you have filled your name, student ID number and program and course titles are clearly written (on the answer book and this question paper) at the appropriate places

Additional Instructions

- 1) Read the question paper carefully
- 2) Clearly state any assumptions made
- 3) Use examples and diagrams where appropriate, in answering the questions
- 4) Start a new question on a new page in the answer book
- 5) Write clearly the question number at the top left margin on each page
- 6) Use both sides of the paper in the answer book



Part 1

Define and illustrate the meaning of **five** of the following terms: (5* 2 = 10 Marks)

- 1) Digital Elevation Model (DEM)
- 2) Limitations of IDW interpolation process
- 3) Breaklines in TIN model
- 4) Geodatabase
- 5) Common measures of dispersion
- 6) Difference between Coverage and Shape file formats

Part 2

Attempt all multiple choice questions – 40*0.5 = 20 Marks

Write multiple choice answer in the brackets against each question and submit this question paper along with the answer book (Make sure that you have written your names on both the answer book and question paper)

Select only one best choice for each question.

1. The system of lines used to locate a certain place on Earth are called...

()

- a) latitude systems
- b) coordinate systems
- c) great circle systems
- d) axis system

2. What is the name of the network of parallels and meridians in a geographic coordinate system?

()

- a) Data frame
- b) Graticule
- c) Grid
- d) Loxodrome

3. With respect to map projection parameters, what do the terms "angular" and "linear" refer to?

()

- a) Standard parallel and central meridian values
- b) Shape and area distortion values
- c) Geographic and projected coordinate values
- d) False easting and false northing values



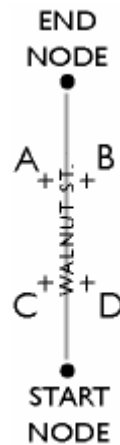
4. If a plane is tangent to a globe, where is contact made? ()
- a) At a single line
 - b) At a pair of points
 - c) At a pair of lines
 - d) At a single point
5. Different spheroids are used throughout the world to account for local irregularities in the shape of the earth. ()
- a) True
 - b) False
6. The number of zones in UTM system are: ()
- a) 50
 - b) 60
 - c) 80
 - d) 100
7. Adelaide is located in which UTM zone? ()
- a) 44
 - b) 56
 - c) 58
 - d) 54
8. Map Grid of Australia (MGA) is a combination of UTM and ----- datum. ()
- a) GDA 94
 - b) AGD 66
 - c) AGD 84
 - d) NAD 97
9. Each map projection is good at preserving one or more spatial properties. ()
- a) True
 - b) False
10. When choosing a map projection, all of the following considerations are important, except one. Which one? ()
- a) The purpose of the map
 - b) The spatial property you want to preserve
 - c) The particular portion of the earth being mapped
 - d) The display units used to measure features



11. In data view, you can view more than one data frame at a time. ()

- a) True
- b) False

12. The ABS has just received a completed questionnaire from 230 Walnut Street. The 200 block of Walnut Street is represented in the database as a line feature bounded by two nodes. Associated with the feature are the following address range attributes: Left: 201–299; Right 200–298. Geocode 230 Walnut Street. Which location — A, B, C, or D — is the most likely location of that address? ()



- a) A
- b) B
- c) C
- d) D

13. What is an address range? ()

- a) An attribute associated with vector features that represent street segments.
- b) A vector feature that represents the location and extent of a street segment.
- c) A vector feature that represents the locations of several households.
- d) An attribute associated with vector features that represent household locations.

14. The beginning and ending locations for a line are called: ()

- a) Nodes
- b) Stops
- c) Events
- d) Points

15. Locations that must be visited on a route are called: ()

- a) Facilities
- b) Sites
- c) Stops
- d) Events



16. Data about data are often called: ()
- a) More data.
 - b) Metadata.
 - c) A card catalog.
17. In the world of GIS, another term for the property of connectivity is: ()
- a) proximity
 - b) neighborhood
 - c) topology
 - d) boolean identity
 - e) location
18. Which of the following statements is true? ()
- a) You can use the Field Calculator to perform a location query.
 - b) The Field Calculator is used to join two tables.
 - c) The Field Calculator is available only in an edit session.
 - d) The Field Calculator is used to populate attribute values for a selected set.
19. You're doing an analysis on the trees located within a city park. You have a point feature class representing trees throughout the city. You also have a polygon feature class representing the park. Which geoprocessing tool would you use to create a feature class containing only trees inside the park? ()
- a) Union
 - b) Buffer
 - c) Clip
 - d) Intersect
20. In ArcCatalog, you can perform all of the following tasks, except one. Which one?()
- a) Explore data
 - b) Explore metadata
 - c) Preview a table
 - d) Edit a map
21. It is highly recommended that you set up your analysis options before you perform any spatial analysis. ()
- a) True
 - b) False



22. A raster named LandCover has a cell size of 90 and a raster named Elevation has a cell size of 30. If you set an analysis cell size to be the same as the layer LandCover and then reclassify Elevation into four elevation zones, what cell size does the resulting raster contain? ()
- a) 4
 - b) 30
 - c) 60
 - d) 90
23. Temporary grids are automatically deleted when which of the following occurs? ()
- a) You quit ArcMap without saving your work.
 - b) You quit ArcMap and save your work.
 - c) You don't name them within 10 minutes.
 - d) You perform another Spatial Analyst operation.
24. What is the effect of setting an analysis extent to Same as Layer "Elevation"? ()
- a) Analysis results will share the same cell size as the Elevation layer.
 - b) Analysis results will treat the Elevation layer as a mask.
 - c) Analysis results will share the same x,y coordinates from the bottom-left and top-right corners of the Elevation layer.
 - d) Analysis results will share the same x,y coordinates from the intersection of the Elevation layer and all other inputs.
25. The options you set in the Analysis Options dialog control all of the following properties of the output grid except one. Which one? ()
- a) Color ramp
 - b) Cell size
 - c) Extent
 - d) Projection
26. What is the effect of setting an analysis mask to a layer named Zones and setting an analysis extent to Same as Layer "Vegetation"? ()
- a) Analysis results will share the same extent as the Zones layer and contain NoData values that correspond to NoData values in the Zones layer.
 - b) Analysis results will share the same cell size as the Vegetation layer and share the same extent as the Zones layer.
 - c) Analysis results will share the same x,y coordinates from the intersection of the Zones layer and the Vegetation layer.
 - d) Analysis results will share the same extent as the Vegetation layer and contain NoData values that correspond to NoData values in the Zones layer.



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27. When you convert features to a raster, which of the following settings is used to control the height and width of the output raster? ()
- a) Analysis extent
 - b) Analysis coordinate system
 - c) Analysis cell size
 - d) Analysis mask
28. If an analysis extent is set to be the same as a raster layer named Soils, and Soils has a cell size of 30, what is the effect of setting an analysis cell size of 60? ()
- a) Analysis results will have a cell size of 30.
 - b) Analysis results will have a cell size of 20.
 - c) Analysis results will have the same cell size as the largest input.
 - d) Analysis results will have a cell size of 60
29. The default sun position used by Compute Hillshade has an altitude of 45 degrees with an azimuth of 315 degrees. ()
- a) True
 - b) False
30. For scientific analysis, the contour line representation of elevation is more suitable than the hillshade representation. ()
- a) True
 - b) False
31. According to the principle of spatial autocorrelation, which of the following sample points should have most influence on the interpolated elevation of a given cell? ()
- a) A point 60 meters away
 - b) A point 120 meters away
 - c) A point 30 meters away
 - d) Both points 30 and 60 meters away
32. Which of the following phenomenon could not be modeled using interpolation? ()
- a) Elevation
 - b) Air pollution levels
 - c) Soil types
 - d) Snow depth



33. What is the chief drawback of Inverse Distance Weighting?

()

- a) It models spatial autocorrelation with a particular function regardless of the particular properties of the surface being estimated.
- b) Its use is an uncommon interpolation method.
- c) It is the most complex interpolation method.
- d) It models spatial autocorrelation with a flexible approach that matches the appropriate interpolation method to the properties of the surface being estimated.

34. Suppose that you used IDW to interpolate a set of sample points representing elevation, where the sample point values ranged from -23 to 97 . Which of the following values could not exist in the interpolated surface?

()

- a) 12
- b) 82
- c) 101
- d) -22

35. Suppose that you are using IDW to model pollution levels at well locations and you want to show that the highest pollution levels are concentrated at the wells but dissipate quickly with distance. Which of the following power settings would best demonstrate this phenomenon?

()

- a) 0.5
- b) 0.1
- c) 1
- d) 3

36. Which of the following best describes when you should use the IDW interpolation method?

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- a) When you want to interpolate phenomena whose distribution is strongly correlated with distance
- b) When you want to estimate a surface with only a limited number of sample points
- c) When you want to estimate distances between all possible pairs of sample points and use this information to model the spatial autocorrelation for the particular surface
- d) When you want to estimate values that are below the minimum or above the maximum values found in the sample data



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37. Which of the following is not a common measure of dispersion? ()
- a) Standard deviation
 - b) Least Frequent Value (LFV)
 - c) Variance
 - d) Range
38. The terms "central tendency" and "dispersion" are synonyms. ()
- a) True
 - b) False
39. A pie chart is best suited to representing which of the following attributes? ()
- a) The dates on which water lines were installed in a subdivision
 - b) The percentage contributions of agriculture, industry, and services to an economy's GDP
 - c) Mean elevation for adjacent tracts of land
 - d) The correlation between per capita income and credit card debt
40. The acronym MAT stands for Point of: ()
- a) Maximum Alignment Tension
 - b) Marginally Accurate Triangulation
 - c) Minimum Aggregate Travel
 - d) Most Attractive Tendency