GGR3A10/03A3

2019 – Memo

SECTION A (Mrs Schoeman)

QUESTION 1

You work for a GIS company. A new employee is appointed, and you were asked to do the following:

- explain to this person what Geographical Information Systems (GIS) are;
- indicate the advantages and disadvantages of GIS. (10)

Definition (3)

Components – hardware, software, spatial data, data management & analysis, people + clear explanation of each component (5)

At least 2 advantages & 2 disadvantages (2)

QUESTION 2

Give an overview of the different map projections and outline the important implications thereof for GIS. (10)

Distinguish and discuss conical, cylindrical & azimuthal (3)

Distinguish between conformal, equivalent, equidistant & azimuthal and what properties are preserved (4)

Implications (3)

QUESTION 3

Explain the raster data model and structure and indicate where you would use it in GIS. Use sketches to illustrate your answer. (10)

Raster – both model and structure explanation (4)

Raster sketch (2)

Advantages and disadvantages (2)

Use, e.g. satellite, continuous surfaces, etc. (2)

QUESTION 4

Motivate why an electronic database approach is necessary in GIS and discuss GIS database issues. (10)

Advantages of using an electronic DB compared to traditional method (5)

DB issues – should include both for smaller and larger projects (5)

QUESTION 5

You are asked to develop a GIS to monitor and report on river flooding. Where would you obtain spatial and attribute data for such a GIS project? Also indicate if the data sources are primary or secondary data. Lastly, explain how you would capture the data in a GIS. (10)

Spatial data sources + examples + primary/secondary (2)

Attribute data sources + examples + primary/secondary (2)

Input methods – relevant to the data sources identified, combination of keyboard, scanning, digitizing & electronic transfer + clear explanation of each (6)

QUESTION 6

6.1 You are employed by the City of Johannesburg's urban and regional planning department. Identify THREE GIS analyses you can use in urban and regional planning. For each of the three analyses explain how it is done in GIS, motivate why you would use it and illustrate your answer by using examples. (10)

Any 3 suitable analysis + motivation (10)

6.2 Explain how measurements are done in a GIS. (5)

Distance, perimeter & area + distinguish between vector & raster (5)

6.3 Discuss the different spatial interpolation techniques you can use in GIS. (10)

Explanation of what is spatial interpolation (2)

Thiessen polygons (2)

TIN (2)

Spatial moving average (2)

Trend surface (2)

SUB TOTAL [75]

SECTION B (Prof. Lash)

QUESTION 1

1.1 Explain why geographers create analytical models. (3)

1.2 Write six geographical questions: two questions that would require a representation model; two questions that would require a suitability model; and two questions that would require a process model. (6)

1.3 You have been asked to create an analytic model to locate a new solar power plant in South Africa. List at least four data inputs that you would need for your model. (4)

QUESTION 2

Explain how errors occur in spatial data. (12)

Staff member responsible for Section B was a visiting Fulbright scholar and therefore memo cannot be provided.

SUB TOTAL [25]

TOTAL [100]