0305N218

Candidate's Seat No :_____

MSc Sem.-2 Examination

409

Geoinformatics

May-2025

Time : 2-30 Hours] **[Max. Marks : 70**

Que 1. **14**

(A) Define the different types of spatial data: discrete and continuous. Explain with examples.
(B) Discuss scales of measurement. How do they influence statistical analysis in GIS?
OR
(A) Explain measures of central tendency and dispersion used in spatial statistics.
(B) Differentiate between normal, binomial, and Poisson probability distributions with examples relevant to spatial analysis.

Que 2. **14**

(A) What is spatial autocorrelation? Explain Moran's I and its interpretation.
(B) Describe the construction and interpretation of scatter diagrams and residual mapping in regression analysis.
OR
(A) Explain bivariate and multivariate regression with a suitable GIS-based example.
(B) Write a note on Principal Component Analysis (PCA) in spatial data interpretation.

Que 3. **14**

(A) Discuss the method of interpolation using variogram and kriging.
(B) Compare and contrast IDW and trend surface analysis with advantages and limitations.
OR
(A) What is a Digital Elevation Model (DEM)? Discuss slope, aspect, hill shade and viewshed analysis.
(B) Explain the role of semi-variogram in spatial interpolation.

Que 4. **14**

(A) Describe map algebra and grid-based operations: local, focal, zonal and global functions.
(B) Explain point-in-polygon, line-in-polygon, and polygon-in-polygon overlay operations with examples.
OR
(A) Discuss multilayer vector operations: union, intersection, symmetrical difference, and dissolve.
(B) Explain raster-based cost surface analysis, optimal path and proximity search.

(P.T.O)

N218-2

Que-5Each question carries 1 mark. **14 Marks**

1. **Define:** Spatial Allocation

2. **True or False:** A symmetrical difference operation preserves overlapping regions.

3. Which index evaluates the cyclicity of a network?
   A) Beta Index
   B) Gamma Index
   C) Alpha Index
   D) Eccentricity Index

4. **Define:** Variogram

5. **True or False:** Raster analysis is suitable for network-based pathfinding

6. **Define:** Cost Distance

7. Which one is a global function in raster GIS?
   A) Local sum
   B) Zonal mean
   C) Maximum of entire raster
   D) Mean of neighbourhood

8. **Define:** Linear Referencing

9. Which of the following is *not* part of map algebra? *(Moderate)*
   A) Raster reclassification
   B) Local sum
   C) Union
   D) Zonal statistics

10. **True or False**: PCA is only useful for classifying categorical spatial data.

11. **Define:** Dispersion Distance

12. Which spatial model best represents complex entities like rivers with bends and attributes?
   A) Raster
   B) Vector
   C) Object-Oriented
   D) Topological

13. **True or False:** Buffering is only meaningful in raster GIS.

14. **Define:** Filtering in Raster Analysis