Roll.No. | **25PBSET3A03**

SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
M.Sc.Biostatistics - END SEMESTER EXAMINATIONS - NOVEMBER 2025
SEMESTER - III
25PBSET3A03 - Spatial Statistics

Total Duration : 2 Hrs. 30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Explain the main components of spatial data with suitable examples.
2. Explain the main capabilities of a Geographic Information System (GIS).
3. What is a spatial point pattern? Explain the difference between random, clustered, and regular patterns.
4. Briefly describe spatial epidemiology and its role in disease mapping.
5. Write short notes on Bayesian models for disease mapping.
6. Differentiate between vector data and raster data in spatial statistics.
7. Briefly describe what is meant by edge effects in spatial data analysis.
8. Explain the concept of Restricted Maximum Likelihood (REML) estimation in simple terms.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Describe the different coordinate systems used in spatial statistics and explain how they help in mapping and spatial analysis.
10. Discuss the major problems faced while handling spatial data in GIS and suggest possible solutions.
11. Describe how the K-function and global indexes of spatial autocorrelation help to distinguish between random, clustered, and regular spatial patterns.
12. Describe kriging methods for non-Gaussian data and explain how regression models can be applied to spatially auto-correlated data.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Discuss the structure and advantages of Bayesian hierarchical models and Generalized Linear Mixed Models (GLMMs) in spatial data analysis.

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