Roll.No. | 24PBSCT3008

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
24PBSCT3008 - Generalised Linear Models

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

Section B

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

1. Explain the assumptions of the Standard Gauss-Markov Model in linear regression.
2. Distinguish between R^2 and adjusted R^2.
3. Describe the components of a Generalized Linear Model (GLM) with examples.
4. Apply the concept of Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) for model selection in GLMs.
5. Explain the difference between Multinomial and Ordinal Logistic Regression with suitable examples.
6. Illustrate how the Parallel Line Regression model is used in Ordinal Logistic Regression.
7. Explain Log Linear Model for Contingency table.
8. Examine how Gamma distribution models are used in GLMs and compare them with log-normal models.

Section C

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

9. Derive and discuss the variance-covariance matrix of least square estimators in a multiple linear regression model.
10. Apply and interpret residual diagnostics (Pearson, Deviance, and Anscombe residuals) for a fitted GLM.
11. Develop and justify an Ordinal Logistic Regression model using both qualitative and quantitative predictors.
12. Discuss and analyze the Likelihood function and parameter estimation in Poisson regression models.

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

13. Critically evaluate the inference and residual analysis of GLMs with Gamma distribution and discuss its applications.

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