WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 5th Semester Examination, 2020, held in 2021

STSADSE03T-STATISTICS (DSE1/2)

ECONOMETRICS

Time Allotted: 2 Hours | Full Marks: 40

The figures in the margin indicate full marks.
Candidates are required to give their answers in their own words as far as practicable.
All symbols are of usual significance.

GROUP-A

Answer any *four* questions from the following 5×4 = 20

1. Discuss the assumptions made on multiple regression model. 5

2. Find the MLE and Hessian matrix of β and σ^2 where $y = X\beta + \varepsilon$ and $\varepsilon \sim N(0, \sigma^2 I)$. 5

3. Discuss on the possible reasons for heteroskedasticity. 5

4. Discuss on the sources of autocorrelation. 5

5. What will be consequences of multicollinearity? 5

6. What is Spearman's rank correlation test in heteroskedasticity? 5

GROUP-B

Answer any *two* questions from the following 10×2 = 20

7. (a) Develop the likelihood ratio test for $H_0 : R\beta = r$ where $y = X\beta + \varepsilon$. 6

   (b) Make a discussion on coefficient of determination (R^2) and adjusted R^2. 4

8. (a) Discuss Bartlett's test on heteroskedasticity assuming the hypothesis. 6

   (b) Compare the OLS and GLS estimates of $\beta = (\beta_0, \beta_1)'$ where $y_i = \beta_0 + \beta_1 x_i + \varepsilon_i$. 4

9. (a) Estimation procedures with autocorrelated errors when autocorrelation coefficient is unknown. 6

   (b) Discuss the Durbin Watson test for autocorrelation. 4

10. (a) Make a discussion on the remedies of multicollinearity. 6

    (b) What is ridge regression? Find bias and variance of ridge estimator. 4

N.B. : *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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