M.A./M.Sc. 2nd Semester Examination, 2023

ECONOMICS

PAPER—ECO-201

(*Statistics and Basic Econometrics*)

(Old and New Syllabus)

Full Marks : 40

Time : 2 hours

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP—A

1. Answer any *two* questions : 2×2

(*a*) Write the conditions of mutual independence of three events.

(*b*) Briefly present the concept of degrees of freedom used in statistics and econometrics.

(*c*) Distinguish between point estimation and interval estimation.

(*d*) Why and how is a disturbance term included in the classical linear regression model ?

2. Answer any *two* questions : 4×2

(*a*) State and prove the sum law of expectation.

(*b*) Define and explain the power of a test.

(*c*) Explain how frequency chi-square is used for the test of homogeneity.

(*d*) Describe briefly the effects of omitting a relevant explanatory variable in the classical linear regression model.

3. Answer any *one* question : 8×1

(*a*) Find sampling mean and sampling variance of the sample mean for SRSWR and SRSWOR. $(1 + 2) + (2 + 3)$

(*b*) Explain briefly the one way analysis of variance. Explain the advantages of the *t*-test over the analysis of variance in comparing the means of two populations. $4 + 4$

GROUP–B

4. Answer any *two* questions : 2×2

(*a*) Why does autocorrelation occur in an econometric model ? Explain.

(*b*) With the help of an example, show how dummy variable may act as a proxy for the dependent variable.

(*c*) Explain with the help of a flowchart the functions of Econometrics.

(*d*) Present a real life example of Heteroscedasticity.

5. Answer any *two* questions : 4×2

(*a*) 'Multicollinearity is not a methodological problem, it is the problem with the data matrix.' – Explain clearly. 4

(*b*) Explain the Durbin-Watson test. What are its limitations ? $2 + 2$

(*c*) What are the major consequences of the problem of Multicollinearity ? Prove any one of them. 2 + 2

(*d*) How would you test the presence of heteroscedasticity in an econometric model ? 4

6. Answer any *one* question : 8 × 1

(*a*) Stating the assumptions, prove that in a general linear regression model the OLS estimator statisfies the BLUE properties.

(*b*) Derive the rank and order conditions for identification in a simultaneous equations system.