

2007

ECONOMICS

FOURTH PAPER

Full Marks: 80

Time: 3 hours

*The figures in the margin indicate full marks
for the questions*

Write the answers to the two Halves in separate books

FIRST HALF
(Statistical Methods)

1. Answer the following: 2×4=8
- a) Define Bayes' theorem.
 - b) What is meant by sampling distribution of a statistic?
 - c) What do you mean by Splicing of Index Numbers?
 - d) Distinguish between Type I and Type II errors in testing hypotheses.
2. Answer any two of the following: 6×2=12
- a) What are the characteristics of a good estimator?
 - b) Define conditional probability. An urn contains 7 white and 5 black balls. Two balls are drawn at random one after the other without replacement. Find the probability that both balls drawn are black.
 - c) What is binomial distribution? What are its properties?
3. Answer any two of the following: 10×2=20
- a) Distinguish between Laspeyres' and Paasche's Index Numbers. Show how Fisher's Index Number is derived from these two. 3+3+4=10
 - b) What is meant by normal distribution? What are its properties? 2+8=10
 - c) What are the properties of t-distribution? Describe the major applications of t-distribution. 7+3=10

SECOND HALF

(Elementary Econometrics)

4. Answer the following: 2×4=8

- a) In a situation involving three variables X, Y and Z, what is the partial correlation between X and Y?
- b) Under standard assumptions the OLS estimators of regression coefficients are normally distributed. Yet the standard normal variate is usually not used as the statistic for testing hypotheses about regression coefficients. Why is that so?
- c) How are consumer goods categorised into normal goods and inferior goods?
- d) How is the Gini coefficient related to the Lorenz curve?

5. Answer any three of the following: 4×3=12

- a) Why is an equation like $Y = \alpha + \beta X$ not suitable for econometric study? Suitably modify the equation to adapt it for econometric use.
- b) Discuss the limitations of the moving average method of estimating trend in a time series.
- c) Explain the merits and demerits of the following formulation of the Engel curve

$$\ln Y = a + b \ln X$$

where Y is household expenditure on a consumer good and X is household income.

- d) Outline the essence of the multicollinearity problem.
- e) State and explain Pareto's law of income distribution.

6. Answer any two of the following: 10×2=20

- a) Illustrate the use of the variate difference method to determine the degree of a polynomial to be fitted to a time series. 10
- b) Derive the OLS estimators of the parameters of the regression model
 $Y = \alpha + \beta X + u$
Show that under standard assumptions, the OLS estimator of β is the best linear unbiased estimator. 4+6=10
- c) Show how the OLS estimate of the two variable linear regression model can be used to generate an internal prediction. 10
- d) Outline the features of the log-normal distribution and discuss its usefulness for representing distribution of income in a society. 10