

INDIAN STATISTICAL INSTITUTE

Semestral I Examination: 2025-2026

M.S. (Q.E.), 2nd Year

Econometric Applications I

Date: 21-11-2025

Maximum marks: 100

Duration: 3 hours

[Answer question number 1(A) or 1(B) and any three questions from the rest of the questions. Allotted marks are given at the end of each question. Symbols and notations are as used in the class.]

1. Answer either (A) or (B)

(A) Describe how Prais and Houthakker (PH) introduced economy of scale parameters in the consumption function to see the effect of household size and composition. Also discuss the estimation procedures. [14+14=28]

Or

(B) Suppose the urban population is just one-fourth of the rural population in a country. The average monthly income of the bottom 10% population of rural and urban sectors are Rs. 35 and Rs. 40, respectively. The respective Lorenz Ratios are 0.28 and 0.40. Assume that income follows lognormal distribution separately for rural and urban sectors. Calculate the percentage of people with income more than Rs.70/- for the country as a whole. [28]

2. The size distribution of population by Per Capita Expenditure (PCE) in Indian rupees per 30 days is given below. Compute (i) the Head Count Ratio (H), (ii) the Income Gap Ratio (I) and (iii) the Sen Index of Poverty (P) from the data. **Assume that the poverty line is Rs. 630 per 30 days.**

PCE (Rs./30 days)	Percentage of population	Average PCE (Rs./30days)
000 – 200	0.87	165
200 – 300	2.25	275
300 – 400	4.74	370
400 – 500	6.99	465
500 – 600	8.50	560
600 – 700	12.64	655
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[6+8+10=24]

3. Describe Linear Expenditure System and describe how it can be derived from a specific utility function. State the desirable criteria for a good demand function and show how Linear Expenditure System satisfy these criteria. How will you estimate its parameters?

[8+12+4=24]

4. Discuss the properties including cost minimization and profit maximization conditions of Cobb-Douglas Production function. What are the statistical problems in the estimation of this function? How can you solve these problems?

[10+10+4=24]

[Contd.]

5. Illustrate how one can calculate Multidimensional Poverty Indices using an appropriate example. [24]
6. Write short notes on any three of the following:
- (i) Tornquist's Forms of Engel curve.
 - (ii) The Elasticity of Substitution.
 - (iii) Estimation of deterministic parametric frontier production function.
 - (iv) Positive measures of inequality.
 - (v) Three Parameter Log Normal Distribution. [8×3=24]