

2023

**ECONOMICS — HONOURS**

**Paper : DSE-A-1 and DSE-A-2**

*The figures in the margin indicate full marks.*

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

**Paper : DSE-A-1**

**(Applied Econometrics)**

**Full Marks : 50**

**Group - A**

1. Answer *any five* questions :

2×5

(a) What is meant by 'panel data'?— Give a suitable example.

(b) In the classical linear regression model given by

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i$$

(with all its usual assumptions), find  $E(Y_i)$  and interpret it.

(c) In the regression model

$$Y_i = \beta_1 X_i^{\beta_2}$$

how do you incorporate the stochastic disturbance term  $u_i$  so that parameters can be estimated by Ordinary Least Square method?

(d) The model

$$Y_i = \beta_1 + \beta_2 X_i + u_i$$

satisfies all the usual assumptions of the classical linear regression model with the following exception :

$$E(u_i^2) = \sigma^2 X_i \quad (X_i > 0)$$

Identify the problem and transform the model so as to remove it.

(e) What are instrumental or proxy variables?

**Please Turn Over**

- (f) From the data for 46 states in the USA for a given year the following regression results are obtained :

$$\log C : 4.30 - 1.34 \log P + 0.17 \log Y$$

$$\text{S.E} : (0.91) \quad (0.32) \quad (0.20) \quad ,$$

$$\bar{R}^2 = 0.27$$

where  $C$  = Consumption of a commodity per year

$P$  = Real price of the commodity

$Y$  = Per capita real disposable income.

- (i) What is the income elasticity of demand for the commodity?  
 (ii) Is it statistically significant?  
 (g) What is non-stationary time series data?  
 (h) What are the consequences of omitting a relevant variables?

### Group - B

2. Answer *any two* questions :

- (a) For a given data set, the plot reveals that the explained variable ( $Y_i$ ) is increasing more slowly than the explanatory variable ( $X_i$ ).  
 (i) Suggest a possible functional form of the above.  
 (ii) Do you have a linear regression model?  
 (iii) What does the slope coefficient measure? 2+1+2
- (b) (i) For an estimated multiple regression equation,  $R^2$  is found to be high but most of the slope coefficients individually are statistically insignificant. Identify the problem that can explain such a phenomenon.  
 (ii) Do you get precise estimates of the coefficients in the presence of the above problem? Explain your answer by the help of a suitable example. 2+3
- (c) As the criterion of model selection, how would you compare between the  $R^2$  criterion and the Adjusted  $R^2 (= \bar{R}^2)$  criterion? 5
- (d) The quarterly data of expenditure on consumer durables for 20 years are obtained. To deseasonalize the data using dummy variables, the following two models are used :

$$\text{Model 1} : \hat{Y}_t = \hat{\alpha}_1 D_{1t} + \hat{\alpha}_2 D_{2t} + \hat{\alpha}_3 D_{3t} + \hat{\alpha}_4 D_{4t}$$

$$\text{Model 2} : \hat{Y}_t = \hat{\alpha} + \hat{\beta}_2 D_{2t} + \hat{\beta}_3 D_{3t} + \hat{\beta}_4 D_{4t},$$

where  $D_{it}$  is the dummy for the  $i$ -th quarter,  $i = 1, 2, 3, 4$

Which model will you choose and why? 2+3

(3)

Z(5th Sm.)-Economics-H/DSE-A-1 & DSE-A-2/CBCS

Group - C

3. Answer any three questions :

(a) From a sample of 209 firms the following regression results are obtained :

$$\log(\text{Salary}) = 4.32 + 0.280 \log(\text{Sales}) + 0.0174 \text{roe} + 0.00024 \text{ros}$$

$$\text{S.E.}: \quad (0.32) \quad (0.035) \quad (0.0041) \\ (0.00054)$$

$$R^2 = 0.283$$

where salary = salary of CEO  
sales = annual firms' sales  
roe = return on equity in percent  
ros = return on firm's stock

- (i) Interpret the regression taking into account any prior expectations that you may have about the signs of the various coefficients.
- (ii) Which of the coefficients are individually significant at 5% level?
- (iii) Can you interpret the coefficient of roe and ros as elasticity coefficients? Why or why not?
- (iv) What is the overall significance of regression? 3+2+3+2

(b) Consider the following regression equation :

$$y_i = \alpha + \beta_1 x_{1i} + \beta_2 x_{2i} + u_i \quad u_i \sim \text{IN}(0, \sigma^2)$$

The data for a sample of 33 observations are noted below where observations are measured as derivations from sample mean :

$$\bar{x}_1 = 20; \bar{x}_2 = 8; \bar{y} = 30$$

$$\sum x_{1i}^2 = 15; \sum x_{1i}x_{2i} = 10; \sum x_{2i}^2 = 15$$

$$\sum x_{1i}y_i = 20; \sum x_{2i}y_i = 16; \sum y_i^2 = 32$$

- (i) Estimate the parameters in the model.
  - (ii) Find  $R^2$  and  $\bar{R}^2$ .
  - (iii) Check the overall significance of the slope coefficients at the 5% level of significance. 5+2+3  
[Given  $F_{0.05}(2, 30) = 3.32$ ]
- (c) (i) What are the common types of specification errors committed in developing an econometric model?

Please Turn Over

(ii) The following informations are given—

$$Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i \dots \text{true model}$$

$$Y_i = \alpha_1 + \alpha_2 X_{2i} + v_i \dots \text{fitted model}$$

$$\text{and } E(\hat{\alpha}_2) = \beta_2 + \beta_3 b_{32}$$

where  $b_{32}$  is the slope in the regression of  $X_3$  on  $X_2$ .

Write down and explain the conditions under which  $\hat{\alpha}_2$  will be unbiased. Does the bias of  $\hat{\alpha}_2$  vary when  $X_3$  is positively or negatively related to both  $Y$  and  $X_2$ ?

(iii) Between an underfitted model and an over-fitted model, which one do you prefer for hypothesis testing and why? 3+(2+2)+3

(d) Let the true relation between the total cost ( $Y$ ) and the total output ( $X$ ) be captured by a cubic function while the researcher fits a linear function instead. Explain the steps involved to check whether the linear model is really a misspecified one. 10

(e) (i) Mention two methods of de-trending in a time series.

(ii) Fit a linear trend to the following figures of sales for a firm and estimate the sales figure in 2029 :

Year :	2016	2017	2018	2019	2020	2021	2022
Sales ('000 tons) :	110	121	116	136	140	157	170

2+6+2

**Paper : DSE-A-2**  
**[Economic History of India (1857-1947)]**  
**Full Marks : 65**

**Group - A**

1. Answer *any ten* questions from the following : 2×10
- (a) Explain the concept of 'Economic Drain'.
  - (b) Mention two causes for the industrial backwardness of India under British rule.
  - (c) How did the tariff policy pursued by the British government lead to the decay of handicrafts in India?
  - (d) Mention any two recommendations of Fowler Committee about the currency system in India.
  - (e) What was the main difference between the Ryotwari System and the Mahalwari System?
  - (f) Mention two positive effects of railway expansion in India.
  - (g) Mention two causes that led to the commercialisation of Indian agriculture.
  - (h) Mention two industries whose protection was rejected by the government even though recommended by the Tariff Board.
  - (i) Mention two ways in which unilateral transfer of funds from India to Britain was done.
  - (j) Mention two features of the 'Old Guarantee System' in railway construction.
  - (k) What is 'Ottawa Agreement'?
  - (l) Mention two gross abuses done by the Managing Agencies.
  - (m) What was the 'triple formula' for selection of industries for protection suggested by the first Fiscal Commission appointed in 1921?
  - (n) Name two commercial crops that were produced during the British rule.
  - (o) What was the 'Ratio-Controversy' originating from the recommendations of the Hilton-Young Commission?

**Group - B**

2. Answer *any three* questions from the following : 5×3
- (a) What were the main functions of a Managing Agency?
  - (b) What were the economic effects of 'Economic Drain'?

**Please Turn Over**

- (c) Discuss the consequences of commercialisation of Indian agriculture during the British rule.
- (d) What were the injurious effects of railway expansion in India?
- (e) What were the main recommendations of the Hilton-Young Commission?

**Group - C**

3. Answer **any three** questions from the following :

- (a) Discuss whether the policy of 'Discriminating Protection' contributed to the industrial development in British India. 10
- (b) Discuss the evolution of the Indian currency system from the Silver standard to Gold Exchange standard. 10
- (c) How do economic historians establish the phenomenon of 'de-industrialisation' in India in the 19th century? What were its effects? 6+4
- (d) Discuss the different phases of development of Indian railways between 1844 and 1914. 10
- (e) Discuss how land ownership structure and revenue arrangements under the Permanent Settlement changed in British India. 10