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 :

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

   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 :

$$\log C : 4.30 - 1.34 \log P + 0.17 \log Y$$
$$\text{S.E :} \quad (0.91) \quad (0.32) \quad (0.20)$$
$$\bar{R}^2 = 0.27$$

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 stabilitically 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 $R^2 \left(= \bar{R}^2\right)$ 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 :

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

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

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

Group - C

3. Answer *any three* questions :

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

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

S.E.:   (0.32) (0.035)   (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 significicncne. [Given $F_{0.05}(2, 30) = 3.32$]   5+2+3

(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—

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

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

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

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