LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.Sc.** DEGREE EXAMINATION – **STATISTICS**

FOURTH SEMESTER – **NOVEMBER 2012**

# ST 4207/4204 - ECONOMETRICS

 Date : 07/11/2012 Dept. No. Max. : 100 Marks

 Time : 1:00 - 4:00

**Section –A**

**Answer all the questions: (10 x 2 = 20)**

1. Mention any two property of variance.
2. Write a note on interval estimation.
3. Define BLUE
4. Obtain ESS from the following data given that RSS = 133.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Y | 10 | 14 | 17 | 20 | 25 | 30 | 19 | 27 |

1. Define hypothesis
2. What is Multiple Regression? Give an Example.
3. Give the formula for Durbin Watson d – statistic.
4. What do you mean by bench mark category?
5. State the reasons under which Multicollinearity arises.
6. Define lagged variables.

 **Section –B**

**Answer any five questions: ( 5 x 8 = 40)**

1. A card is drawn from a pack of 52 cards. Find the probability of getting a king or a heart or a red card.
2. The diameter of an electric cable, say X, is assumed to be a continuous random variable with p.d.f: $f\left(x\right)=6x\left( 1-x\right), 0\leq x\leq 1.$
3. Check that $f\left(x\right)$ is p.d.f.
4. Determine a number b such that P ( X < b ) = P ( X > b ).
5. Explain in detail the Goals of Econometrics.
6. Derive least square estimators for simple linear regression model.
7. Explain in detail Variance Inflation Factor.
8. From the following data estimate d-statistic and test for autocorrelation.

et : 0.6, 1.9, -1.7, -2.2, 1.3,3.2, 0.2,0.8, 2.1, -1.5, -1.1

 (Given dL = 1.45 and du = 1.65)

1. What are dummy variables? Explain its usefulness in regression analysis with

 example.

1. Find the value of R2 for the following data:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Y | 12 | 8 | 9 | 6 | 8 |
| X1 | 8 | 10 | 4 | 3 | 6 |
| X2 | 10 | 12 | 6 | 5 | 7 |

**Section – C**

 **Answer any two questions: ( 2 x 20= 40)**

1. Two random variable X and Y have the following joint probability density function:

$$f\left( x, y\right)=\left\{\begin{matrix}2-x-y; 0\leq x\leq 1, 0\leq y \leq 1\\0, otherwise\end{matrix}\right.$$

 Find (i) Marginal probability density functions of X and Y

1. Conditional density functions
2. Var ( X) and Var ( Y)
3. Covariance between X and Y.
4. Consider the following data on X and Y

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 50 | 42 | 71 | 35 | 61 | 45 | 53 | 45 | 38 | 41 | 63 | 34 | 41 |
| Y | 145 | 123 | 155 | 120 | 150 | 130 | 155 | 120 | 135 | 160 | 165 | 115 | 120 |

1. Estimate the equations of Y on X
2. Test the significance of the parameters at 5% level of significance.
3. Given the following data the estimated model is $ \hat{Y} = -0.29+0.91 X$. Test the problem of heteroscedasticity with the help of park test.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 | 6 |
| Y | 2 | 2 | 2 | 1 | 3 | 5 |

1. Fit a linear regression model for the given data by the use of dummy variables

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Aptitude score | 4 | 9 | 7 | 3 | 5 | 8 | 9 | 5 | 6 | 8 |
| Education qualification | UG | PG | UG | HSC | PG | UG | PG | HSC | UG | PG |

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