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| **ST. JOSEPH’S COLLEGE (AUTONOMOUS), BANGALORE-27** |
| **B.A. - VI SEMESTER** |
| **SEMESTER EXAMINATION: APRIL 2019** |
| **ECADE 6318 –BASIC ECONOMETRICS** |
|  |  |  |  |  |  |  |
| **Time- 2 1/2 hrs** |  |  **Max Marks-70** |  |
|  |  |  |  |  |  |  |
| ***This paper contains 2 printed pages and 3 parts*****PART A** |

1. **Answer any TEN of the following. 3X10=30**
2. Define econometrics. What are its objectives?
3. What are time series and cross sectional data? Give an example.
4. State any three properties of Normal distribution.
5. What are Marginal and Joint probabilities?
6. Distinguish between Type I and type II errors.
7. The following regression results show the annual observations from 1985 to 2005 for Canada where Y= Exchange rate of Canadian dollar and X = ratio of the price index that is, X represents the relative price in two countries

Ŷt = -0.912+2.250 Xt

S E = (0.096) R 2= 0.440

Interpret this regression. How do you interpret R 2?

1. Define central limit theorem.
2. What is Durbin –Watson statistic?
3. What is Heteroscadasticity? Mention its causes.
4. The manufacturer of a certain make of electric bulbs claims that his bulbs have a mean life of 25 months with a standard deviation of 5 months. A random sample of 6 such bulbs gave the following values.

By applying‘t’ test, Can you regard the producer’s claim valid at 1% significance level? (The table ‘t’ value at 0.01 significance level is given at 4.032

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Life of bulbs (months) | 24 | 26 | 30 | 20 | 20 | 18 |

1. What are Semi log models? What are its uses?
2. State any three consequences of autocorrelation.

**PART B**

1. **Answer any TWO of the following. 2x5=10**
2. Briefly explain the methodology of Econometrics.
3. The following table provides a probability distribution for a random variable x.

|  |  |
| --- | --- |
| x | f(x) |
| 3 | 0.25 |
| 6 | 0.5 |
| 9 | 0.25 |

Compute the Expected value and variance of x.

1. In an experiment on immunization of cattle from tuberculosis, the following results are obtained

|  |  |  |
| --- | --- | --- |
|  | Affected | Not Affected |
| Inoculated | 12 | 26 |
| Not Inoculated | 16 | 6 |

Calculate chi-square (χ2) ) and discuss the effect of vaccine in controlling susceptibility of tuberculosis ( 5 % significance value of χ2 for one degree of freedom = 3.84)

**PART C**

1. **Answer any TWO of the following 2X15=30**
2. The following data gives mean hourly wage($) by education derived by the population survey conducted in 1985 for United States.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Years of Schooling (x) | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
| Mean wage (Y) | 4.4567 | 5.77 | 5.9787 | 7.3317 | 7.3182 | 6.5844 | 7.8182 | 7.8351 | 11.0223 | 10.6738 |

1. Build a two variable regression model of the form

$Y\_{i}$=$β\_{1}$+$β\_{2}X\_{2i}$+$u\_{i}$

1. Compute the Variance and standard errors of $\hat{β}$1 and $\hat{β}$2

1. Interpret the results.
2. Estimate R Square
3. A firm wishes to compare four programmes for training workers to perform a certain manual task. Twenty new employees are randomly assigned to the training programs, with 5 in each program. At the end of the training period, a test is conducted to see how quickly trainees can perform the task. The number of times the task is performed per minute is recorded for each trainee with the following results

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Observation | Program 1 | Program 2 | Program 3 | Program 4 |
| 1 | 9 | 10 | 12 | 9 |
| 2 | 12 | 6 | 14 | 8 |
| 3 | 14 | 9 | 11 | 11 |
| 4 | 11 | 9 | 13 | 7 |
| 5 | 13 | 10 | 11 | 8 |

Construct ANOVA table for the above data and test at the 5% level of significance, whether the treatments differ in their effectiveness. Critical value is 3.24

1. What is multicollinearity? What are its consequences? How is it detected? Suggest the remedial measures.

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