**ST. JOSEPH’S COLLEGE (AUTONOMOUS), BENGALURU -27**

Registration Number:

Date & Session

**B.A–6th SEMESTER**

**SEMESTER EXAMINATION: APRIL 2024**

**(Examination conducted in May /June 2024)**

**ECAVO 6323: BASIC ECONOMETRICS**

**(For current batch students only)**

**Time: 2 Hours Max Marks: 60**

**This paper contains TWO printed pages and THREE parts**

**(Scientific calculator is allowed)**

**PART-A**

1. **Answer any TEN of the following. 3X10=30**
   1. Define econometrics.
   2. Describe the difference between regression and correlation.
   3. Define hypothesis testing.
   4. Define the concepts of Type I and Type II errors.
   5. What is a probability distribution function?
   6. Distinguish between a population and a sample in statistical studies.
   7. What are the purposes of OLS estimation?
   8. The percentage of marks obtained by a student in the monthly tests are given below:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Test | 1 | 2 | 3 | 4 | 5 |
| Percentage of marks obtained | 69 | 71 | 73 | 68 | 74 |

Based on the above table, find the probability of students getting more than 70% marks in a test.

* 1. What are partial regression coefficients?
  2. What does the correlation coefficient measure?
  3. Describe the concept of adjusted R².
  4. What is autocorrelation?

**PART-B**

1. **Answer any THREE of the following. 5X3=15**
   1. Analyze the concept of goodness of fit in multiple regression analysis.
   2. Calculate a t-test for the following data of the number of times people prefer coffee or tea in five time intervals.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Coffee | 4 | 5 | 7 | 6 | 9 |
| Tea | 3 | 8 | 6 | 4 | 7 |

* 1. Explain the process and importance of hypothesis testing, with an example.
  2. From the data given below about the treatment of 250 patients suffering from a disease, state whether the new treatment is superior to the conventional treatment:

|  |  |  |  |
| --- | --- | --- | --- |
| Treatment | No. of patients | | |
| Favourable | Not favourable | Total |
| New | 140 | 30 | 170 |
| Conventional | 60 | 20 | 80 |
| Total | 200 | 50 | 250 |

(Given for degree of freedom=1, X2 =3.84)

* 1. Discuss the consequences of multicollinearity in regression analysis.

**PART-C**

1. **Answer any ONE of the following. 15X1=15**
   1. The following data relate to advertisement expenditure (in lakh of rupees) and their corresponding sales (in crore of rupees):

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Advertisement expenditure (X) | 10 | 12 | 15 | 23 | 20 |
| Sales (Y) | 14 | 17 | 23 | 25 | 21 |

Estimate the two variable regression equations and interpret the results.

* 1. Analyze the problem of autocorrelation in econometric models, its effects, detection techniques, and solutions.