**ST.JOSEPH’S UNIVERSITY, BENGALURU -27**

**M.A Economics – II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2023**

**(Examination conducted in May 2023)**

**EC 8122 : STATISTICAL METHODS FOR ECONOMISTS**

**(For 2022-23 batch of students)**

**Time: 2 Hours Max Marks: 50**

**This paper contains 2 printed page and 3 parts**

**PART-A**

Answer any 5 questions (2\*5=10)

1. What is mathematical expectation?
2. If A and B are exhaustive and equally likely events, calculate is P(A) and P(B).
3. What is the Harmonic mean of the following numbers 1,2,3,4,5?
4. What is meant by the term ‘population’ in statistics?
5. Differentiate between type I and type II errors.
6. What is the difference between combinations and permutations?
7. If the mean of a Poisson distribution is 5, what is its variance?

**PART-B**

 Answer any 2 questions (5\*2=10)

1. Illustrate Kurtosis using the normal distribution.
2. Answer the following
3. What is P(A/B) when A and B are mutually exclusive events
4. What are the possible outcomes and their associated probabilities in the toss of two dice?
5. The mean height of 30 saplings is 175 and the variance is 12.

Test the hypothesis that the population mean is 180.

**PART-C**

Answer any 2 questions (15\*2=30)

1. a. Find the correlation between the two variables (8)

| x | 100 | 200 | 300 | 400 | 500 | 600 | 700 | 800 |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| y | 560 | 640 | 580 | 950 | 260 | 820 | 770 | 440 |

b. Discuss the steps involved in ANOVA. (7)

* 1. Prove two properties of the mean. (7)
	2. Use Bayes theorem to solve the following problem:

It is estimated that 50% of emails are spam emails. Some software has been applied to filter these spam emails before they reach your inbox. A certain brand of software claims that it can detect 99% of spam emails, and the probability for a false positive (a non-spam email detected as spam) is 5%. Now if an email is detected as spam, then what is the probability that it is in fact a non-spam email? (8)

1. Discuss Probability and Non- Probability Sampling.