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ATTACH THE QUESTION PAPERT WITH THE ANSWER BOOKLET

Date: 15-4-21

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

**M.A. ECONOMICS- IV SEMESTER**

**SEMESTER EXAMINATION: APRIL 2021**

**EC 8118: STATISTICS FOR ECONOMISTS**

**Time: 2.5 Hours Maximum Marks-70**

**This question paper has 2 printed page and 3 parts**

**Calculator allowed**

**Part A. Answer any five of the following: 2 X 5=10**

1. Mean and median both provide a measure of central tendency. When would we prefer median over mean?
2. State the multiplicative and the additive law of probability.
3. What is Mean Square Error?
4. Differentiate between Type-I and Type-II error.
5. Explain the term “unbiased estimator.”
6. The sample variance of the data is 49 and the mean of the data is 10. What is the coefficient of variation?
7. What is the difference between cluster random sample and stratified random sample?

**Part B. Answer any three of the following: 10 X 3 =30**

1. Given the discrete probability distribution of number of cars sold in a day
	1. Calculate the Expected value
	2. Show the steps to calculate variance

|  |  |
| --- | --- |
| **X** | **f(x)** |
| 0 | 0.18 |
| 1 | 0.39 |
| 2 | 0.24 |
| 3 | 0.14 |
| 4 | 0.04 |
| 5 | 0.01 |

1. During winter in Cincinnati, Mr. Krebs experiences difficulty in starting his two cars. The probability that the first car starts is .80, and the probability that the second car starts is .40. There is a probability of .30 that both cars start.
	1. Define the events involved and use probability notation to show the probability information given.
	2. What is the probability that at least one car starts?
	3. What is the probability that Mr. Krebs cannot start either of the two cars?
2. Explain the weighted and unweighted method of constructing index numbers.
3. What is correlation? What does correlation value of -1 indicate? What is correlation coefficient?
4. Suppose a random variable X follows the normal distribution with variance 4. It is hypothesized that the unknown mean $μ$ is 10. In a sample of 25 observations, the mean value of X is 25. Use a 5 percent significant test to determine if you will reject the null hypothesis of $μ=10$ (z-value 0.05 = 1.96)?

**Part C. Answer any two of the following: 15 X 2 =30**

1. (i) Define normal distribution and state any four characteristics of it.
2. Explain the concept of t-test.
3. Explain the concept of rank correlation.

1. (i) State the Bayes Theorem.

(ii) A firm has two suppliers (Supplier-1 and Supplier-2) for a specific piece. Historically, Supplier-1 provides the piece 65 percent of the time and Supplier-2 provides it 35 percent time. We also know that 2 percent of supplies from Supplier-1 are defective while 5 percent of supplies from Supplier-2 are bad. Given that the firm received a defective piece, what is the probability it came from Supplier-1?

1. The Binomial probability distribution is given by $f\left(x\right)= \frac{n!}{x!\left(n-x\right)!}p^{x}\left(1-p\right)^{\left(n-x\right)}$
	1. Write three properties of the Binomial probability distribution.
	2. GE call-centre is concerned about a low retention rate for employees. On the basis of past experience, management has seen a turnover of 10% of the hourly employees annually. Thus, for any hourly employees chosen at random, management estimates a probability of 0.1 that the person will not be with the company next year. Choosing 3 hourly employees a random, what is the probability that 1 of them will leave the company this year?