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

Register Number:

DATE:

**M.A. ECONOMICS – II SEMESTER**

**SEMESTER EXAMINATION: APRIL 2018**

**ECS 8117: Statistical Method for Economists**

Time-2 ½ hrs Max Marks-70

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

**PART A**

**Answer any TEN of the following 2 X10=20**

1. Which measure of central tendency will you use while studying inequality of income and why?
2. State a measure that will help to identify presence of skewness.
3. Differentiate between raw moments and central moments.
4. Draw the scatter plot when two variables are not correlated.
5. Define unbiasedness.
6. What is mean squared error and how is it useful?
7. If the variance of a sample of 20 observation is 20. Find the variance of its mean.
8. Write the probability mass function of a binomial distribution.
9. What is an estimator?
10. State the desirable properties of an estimator.
11. Differentiate between null hypothesis and alternative hypothesis.
12. State central limit theorem.

**PART B**

**Answer any TWO of the following 10x 2 = 20**

1. Define independent events. Consider the following table representing the classification of students by gender and subject and answer the following questions.

|  |  |  |  |
| --- | --- | --- | --- |
| Subject | Female (F) | Male (M) | Total |
| A: Mathematics | 4 | 14 | 18 |
| B: Economics | 17 | 41 | 58 |
| C: Science | 4 | 25 | 29 |
| D: Arts | 28 | 11 | 39 |
| Total | 53 | 91 | 144 |

 Find

a) $P (A F)$ b) $P (F A)$

c) Are A and F independent events?

1. a) A random variable X is defined to be the mean of two values when two dice are thrown. Find the probability distribution for X. Find the expected value of X and variance of X.
2. A random sample of 16 values is taken from a normal distribution with population mean μ = 25 and standard deviation σ = 3. What is P($\overbar{X}$ > 26) given that P(0≤Z≤1.33) = 0.4066.
3. Prove that the unbiased estimator of population variance is the sum of the squared deviation around the sample mean divided by n-1, where n is the number of observation.

**PART C Answer any TWO of the following** **15 X 2 = 30**

1. Explain the different measures of central tendency along with its advantages and disadvantages.
2. a) Milk is sold at the rates 8, 10, 12 and 15 rupees per litre in four different months. Assuming that a family spends equal amounts on milk in the four months, find the average price in rupees per month.

b) Run the following regression with y as dependent and x as independent variable and provide the value of intercept, slope coefficient and R square

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| X | 1 | 2 | 3 | 4 | 5 |
| Y | 3 | 5 | 6 | 9 | 10 |

1. a) To deal with customer complaint that the amount of coffee powder in a coffee tin is less than the advertised 3 pounds, 20 tins were weighed, yielding the following observations:

2.82, 3.01, 3.11, 2.71, 2.93, 2.68, 3.02, 3.01, 2.93, 2.56, 2.78, 3.01, 3.09, 2.94, 2.82, 2.81, 3.05, 3.01, 2.85, 2.79

Test from these sample of 20 observations whether the mean of is 3 or not, the critical value is t0.01,19 = 2.539

1. The weights (in grams) of a group of five week-old chickens reared on a high-protein diet are 336, 421, 310, 446, 390 and 434.The weights of a second group of 5 chickens similarly reared, except for their low-protein diet are 224, 275, 393, 282 and 365. Is there evidence that the additional protein has increased the weight of the chickens? The critical value t0.05, 9 = 1.833.