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

Register Number:

DATE:

**M.A. ECONOMICS-II SEMESTER**

**SEMESTER EXAMINATION- APRIL-2019**

**EC 8118: STATISTICAL METHODS FOR ECONOMISTS**

### Duration: 2.5 Hours Max Marks: 70

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

**PART A: Answer any FIVE of the following questions 2x5=10**

1. What is geometric mean? What are its uses?
2. Explain the difference between covariance & correlation.
3. If two coins are tossed simultaneously, compute the probability of i) one tail ii) at least one head.
4. What is an unbiased estimator?
5. Explain Bernoulli distribution with usual notations.
6. Briefly discuss Karl Pearson’s Co efficient of Correlation and mention any two properties.
7. Define ANOVA & mention its applications.

**PART B: Answer any THREE of the following questions 10x3=30**

1. Following data is obtained from a class of students about their weight in pounds.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| C.I | 140-150 | 150-160 | 160-170 | 170-180 | 180-190 | 190-200 | 200-210 | 210-220 |
| F | 2 | 12 | 30 | 28 | 24 | 18 | 8 | 3 |

 Calculate Mean, Median, Mode & co-efficient of variation.

1. In Bengaluru, 20% of a random sample of 900 people was smokers & in Mumbai 15% of a random sample of 1600 people were smokers. Can we conclude at 1% significance level that people in Bengaluru are more addicted to smoking than people in Mumbai. (Z0.005 =2.58, Z0.01=2.33)
2. Discuss the various probabilistic & non probabilistic sampling methods.
3. A) What is a chi square distribution? State its features and uses. (4)

 B) Explain the types of errors involved in testing of hypothesis (2)

 C) The data on sale of books in a store per day is given below (4)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 92 | 7 | 17 | 19 | 95 | 95 | 87 | 95 | 95 | 31 | 46 | 39 | 24 | 73 | 64 | 59 | 50 |

Test whether the average sale of books is more than 60 per day at 5% level of significance (t0.005=1.729)

12. The random variable X takes the values of 0, 1 & 4 according to the following probability distribution

|  |  |  |  |
| --- | --- | --- | --- |
| X | 0 | 1 | 4 |
| P(x) | 0.2 | k | K |

a) Determine the constant k.

b) Find E(X), expected value of X

c) Find Var(X), variance of X

**PART C: Answer any TWO of the following questions 15x2=30**

13. The marks obtained by 10 students in a class in two subjects English & Maths is given below. 0

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| English | 56 | 75 | 45 | 71 | 62 | 64 | 58 | 80 | 76 | 80 |
| Maths | 66 | 70 | 40 | 60 | 65 | 56 | 59 | 77 | 67 | 63 |

 Calculate Spearman’s Rank correlation, Karl Pearson’s Co efficient and concurrent deviation.

14. A) State & prove Baye’s Theorem (10)

 B) A quality control inspector, is checking a sample of light bulbs for defects. The following table summarizes her findings. (5)

|  |  |  |  |
| --- | --- | --- | --- |
| **Wattage** | Good | Defective | Total |
| 20 | 80 | 15 | 95 |
| 50 | 100 | 5 | 105 |
| 100 | 120 | 10 | 130 |
| TOTAL | 300 | 30 | 330 |

If one of these light bulbs is selected at random, find the probability that the light bulb is

i) Good given it is 100 watts (ii) Defective given it is 50 watts

(iii) 100 watts given it is good (iv) 50 watts given it is defective

15. Suppose the National Transportation Safety Board (NTSB) wants to examine the safety of compact cars, midsize cars, and full-size cars. It collects a sample of three for each of the treatments (cars types). Using the hypothetical data provided below, test whether the mean pressure applied to the driver’s head during a crash test is equal for each types of car. Use α = 5%. (F2,6= 5.14)

|  |  |  |
| --- | --- | --- |
| Compact cars | Midsize cars | Full size cars |
| 643 | 469 | 484 |
| 655 | 427 | 456 |
| 702 | 525 | 402 |