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

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

**SEMESTER EXAMINATION - APRIL 2018**

**EC: 8116 – Statistical Methods for Economists**

**Time: 2 1/2 Hours Max Marks: 70**

(For supplementary candidates)

Do not write the register number on the question paper

Please attach the question paper along with the answer script.

This question paper has **TWO** printed pages and **THREE** parts

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**PART A Answer any TEN of the following: 10 x 2 = 20**

1. Distinguish between classification and tabulation of data.
2. Give two examples for univariate and bivariate data.
3. List out any four methods of collecting primary data.
4. Suggest appropriate measures to find average for the following situations

a) To find the average of speeds b) To find the average of grades c) To find the average of typing errors in a book d) To find the average percentage of marks

1. What do you mean by the term trend in time series analysis?
2. Define Index number. How it is useful?
3. Define classical definition of probability.
4. What is Binomial Distribution?
5. What is regression analysis?
6. What do you mean by coefficient of determination?
7. Describe stratified random sampling.
8. What do you mean by an estimator? List out desirable properties of an estimator.

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

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Height of Father (X) | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| Height of Son (Y) | 66 | 67 | 65 | 68 | 70 | 68 | 72 |

1. A) Discuss about relation between X and Y using Karl Pearson’s coefficient of correlation.
2. List out any four properties of regression coefficients. (6+4)
3. A) The following are the scores of two batsmen A and B in series of innings. Calculate coefficient of variation and find out the most consistent batsman. (6)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| A | 12 | 115 | 6 | 73 | 7 | 19 | 119 | 36 | 84 | 29 |
| B | 47 | 12 | 76 | 42 | 4 | 37 | 57 | 48 | 13 | 25 |

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B) Calculate price index number from the following data using Fisher’s formula: (4)

|  |  |  |
| --- | --- | --- |
| Commodity | Base Year | Current Year |
| Price (Rs.) | Quantity (units) | Price (Rs.) | Quantity (units) |
| A | 10 | 25 | 15 | 30 |
| B | 15 | 30 | 10 | 30 |
| C  | 20 | 10 | 25 | 20 |
| D | 40 | 25 | 40 | 26 |
| E | 60 | 10 | 50 | 45 |

1. A) State and prove Bayes’ theorem (7)

 B) Define random variable and explain the type of random variables with an example for each. (3)

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

1. A) Compute average returns and variance from the following data (7)

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Returns (X) | -5 | -3 | -1 | 0 | 1 | 3 | 4 | 5 |
| P(x) | 0.05 | 0.25 | 0.1 | 0.07 | 0.16 | 0.1 | 0.17 | 0.1 |

B) A political scientist suspects that there is a relationship between the number of promises a political candidate makes and the number of promises that are fulfilled once the candidate is elected. Following data is the “track record” of 10 politicians. (8)

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Politician  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Promises Made  | 21 | 40 | 31 | 62 | 28 | 50 | 55 | 43 | 61 | 30 |
| Promises Kept | 7 | 5 | 6 | 1 | 5 | 3 | 2 | 6 | 3 | 5 |

Calculate the rank correlation coefficient between promises made and kept and comment on the result.

1. A) A driver of a diesel-powered automobile decided to test the quality of three types of diesel fuel sold in the area, based on mileage per liter. Carryout ANOVA at 1% level of significance. (units: km/liter; F0.01(2,7) = 9.25 ) (10)

Brand A: 38.7 39.2 40.1

Brand B: 41.9 42.3 41.3

Brand C: 48.7 49.2 47.5

 B) Write down probability density function of Normal Distribution with usual notation and list out any three important characteristics of Normal Distribution. (5)

1. A) Show that $\frac{1}{n-1}∑(x\_{i}-\overbar{x}) (y\_{i}-\overbar{y})$ is an unbiased estimator of the population covariance. (7)

 B) Write a note on hypothesis testing. (8)

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