

**MA ECONOMICS  
SECOND SEMESTER  
STATISTICS  
MEC-203**

Duration : 3 hrs.

Full Marks: 70

Time : 20 min.

( PART-A: Objective )

Marks : 20

*Choose the correct answer from the following:*

*1X20=20*

1. If happening of any one of the events is not affected by and does not affect the happening of any one of the others is called
  - a. Independent events
  - b. Disjoint events
  - c. Favourable events
  - d. Equally likely events
  
2. If the random variable X assumes infinite and uncountable set of values, it is said to be
  - a. Discrete random variable.
  - b. Statistic
  - c. Probability distribution.
  - d. Continuous random variable.
  
3. The mathematical expectation of a random variable is
  - a. Sample mean.
  - b. Population mean.
  - c. Arithmetic mean.
  - d. Mean variance.
  
4. A particular value of a statistic which is used to estimate a given parameter is known as
  - a. Point estimate
  - b. Good estimate
  - c. Interval estimate
  - d. Hypothesis
  
5. The standard deviation of the sampling distribution of a statistic is known as
  - a. Parameters
  - b. Sampling Error
  - c. Standard Error
  - d. Statistical Error
  
6. In this \_\_\_ method, a desired number of sample units is selected deliberately depending upon the object of the enquiry
  - a. Judgement sampling.
  - b. Probability sampling.
  - c. Mixed sampling
  - d. Quota sampling.
  
7. If we measure more than two variables on each unit of a distribution, it is called
  - a. Bivariate distribution.
  - b. Multivariate distribution.
  - c. Covaraiation
  - d. Correlation

8. When the relationship is of a quantitative nature, the appropriate statistical tool for measuring the relationship and expressing it in a brief formula is known as-
- Regression
  - Covariance
  - Variance
  - Correlation
9. Quota sampling is a special form of -
- Convenience sampling.
  - Random sampling.
  - Multistage sampling.
  - Stratified sampling.
10. The modern theory of probability is based on the
- Classical approach
  - Both Axiomatic approach & Classical approach
  - Empirical approach
  - Axiomatic approach
11. Regression coefficients are independent of change of-
- Origin but not of scale.
  - Both origin and scale.
  - Origin.
  - Scale.
12. The value of coefficient of correlation always lie between-
- 0 and 1
  - + 1 and -1
  - 1 and 0
  - 1 and 1
13. Correlation observed between variables that cannot conceivably be casually related is called-
- Spurious Correlation.
  - Simple Correlation.
  - Partial Correlation.
  - Positive Correlation.
14. In regression analysis, the regression coefficient  $b_{xy}$  and  $b_{yx}$  are
- Symmetric.
  - Not symmetric.
  - Zero.
  - Infinity.
15. The values obtained from the study of a sample are known as-
- Statistic.
  - Census.
  - Parameter.
  - Population.
16. Judgement Sampling is a probability sampling-
- True
  - False.
  - Both a and b
  - None of the above.
17. The hypothesis is true but our test rejects it-
- Type II error.
  - Type I error.
  - None of the above.
  - Both of the above.
18. The Null Hypothesis is denoted by
- $H_1$
  - $H_A$
  - $H_0$
  - $N_A$
19. A portion of the area under the probability curve of the sampling distribution of the test statistic is called-
- Critical region
  - Degrees of freedom
  - Level of significance
  - Two tailed test

20. The concept of Inverse probability introduced by-
- a. Thomas Bayes
  - b. Jerome Cardan
  - c. Blaise Pascal
  - d. A.N.Kolmogorov

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**[ PART-B : Descriptive ]**

Time: 2 HRS 40 MINS

Marks : 50

[ Answer question no.(1) & any four (4) from the rest ]

1. Prove the theorem that the probability of happening of any one of the two mutually disjoint events is equal to the sum of their individual probabilities. 10
- $P(A \cup B \cup C) = P(A) + P(B) + P(C)$
2. (i) Define Rank Correlation. 5+5=10
- (ii) A test in Mathematics was taken by 7 students. The teacher ranked his pupils according to their academic achievement. The order of achievement from high to low, together with family income for each pupil is-
- A(Rs.8,500), B(Rs.4200), C(Rs.5700), D(8200), D(Rs.25,000),  
E(Rs18,000) and F(Rs 17500)
- Calculate the Spearman's rank correlation between academic achievement and family income
3. (a) Define Standard error of a Statistic. 5+5=10
- (b) Two sets of candidates are competing for the positions on the Board of Directors of a company. The probabilities that the first and second sets will win are 0.6 and 0.4 respectively. If the first set wins, the probability of introducing a new product is 0.8, and the corresponding probability if the second set wins is 0.3. What is the probability that the product will be introduced.
4. (a) Calculate Karl Pearson's Coefficient of correlation from the following data: 8+2=10
- X: 9 8 7 6 5 4 3 2 1  
Y: 15 16 14 13 11 12 10 8 9
- (b) Distinguish between Correlation and Regression Analysis
5. Calculate the regression equation Y on X from the following data- 10
- X: 6 2 10 4 8  
Y: 9 11 5 8 7
6. Compute Chi-square from the following data - 10
- |    |     |     |      |      |
|----|-----|-----|------|------|
| O: | 40  | 440 | 1584 | 4432 |
| E: | 120 | 360 | 1504 | 4512 |

7. Define Sampling. Explain the types of sampling with suitable examples.

2+8=10

8. Explain hypothesis. Describe the types and errors of hypothesis.

5+5=10

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