MA ECONOMICS
FIRST SEMESTER
STATISTICAL METHODS FOR ECONOMIC ANALYSIS
MEC – 105

Duration: 3 Hrs.   Marks: 70

Part : A (Objective)   = 20
Part : B (Descriptive) = 50

[PART-B : Descriptive]

Duration: 2 Hrs. 40 Mins.   Marks: 50

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

1. a. What do you mean by type-I and type-II error. Explain how it is   4+6=10
    related with hypothesis of testing.

    b. A sample of 500 students is found to have a mean average marks 70.
    Can it be reasonably regarded as a sample from large population with
    mean marks71and standard deviation 1.50? Test at 5% level of
    significance.

2. a. Define random variable , pmf and pdf with example.   6+2+2
                                                                              =10
    b. Give one example of mutually exclusive events.

    c. A bag contains 3white and 5 black balls. Two balls are drawn at
    random without replacement. Determine the probability of getting both
    the balls black.

3. a. State multiplicative theorem of probability.What is the necessary and 4+6=10
    sufficient condition for two events to be independent.

    b. If $p(A^c)= 0.7$, $P(B)= 0.7$ and $P(B/A)= 0.5$, find
        i. $P(A/B)$ & ii. $P(A \cup B)$

4. **a.** Define Bernoulli trial with example.

b. State probability mass function of Binomial Distribution. Examine whether the following statement is true or false.
  "The mean of Binomial distribution is 4 and variance is 5" **c.** Ten coins are thrown simultaneously. Find the probability of getting at least seven heads.

5. **a.** Mention three properties of Normal Distribution.

10

 b. Define standard normal variate.

 c. X is normally distributed and the mean of x is 14 and standard deviation is 4. Find out the probability of the following i. $x \geq 20$ ii. $X \leq 20$ iii. $0 \leq x \leq 12$

6. **a.** Define parameter and statistics.

10

 b. What do you mean by sampling distribution and standard error?

 c. $\bar{x}$ is the mean of a random sample taken from a Normal Population . The size of the sample is 25 and population mean is 40, population standard deviation=5. Evaluate $P(\bar{x}>2)$

7. **a.** Write two normal equations of the linear equation
  y= a+bx .

 b. Write two properties of ordinary least square estimators.

 c. Fit the linear equation from the following data.

Ages of Husbands	25	28	30	32	35	36	38	39	42	55
Ages of Husbands	20	26	29	30	25	18	26	35	35	46

Determine the most likely age of husband for the age of wife 25 years.

8. **a.** Define Chi-square. Mention two uses of Chi-square test.

 b. In four tosses of a coin, let X be the number of heads. Tabulate the 16 possible outcomes with the corresponding values of X. By simple counting, derive the distribution of X and hence calculate the expected value of x.

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[PART-A : Objective]

Choose the correct answer from the following: 1×20=20

1. Probability of certain event is____
    a. 0
    b. 1
    c. -1
    d. None of these

2. Probability of null set is
    a. 0
    b. 1
    c. 2
    d. All of these

3. Getting point 7 while tossing a dice is a/an-____
    a. Certain event
    b. Impossible event
    c. Independent event
    d. None of these

4. A bag contains 3 red ,2white and 4 black balls. What is the probability of drawing 2black balls?
    a. 1/6
    b. 1/9
    c. 0
    d. None of these

5. If E and F are two events such that P(E) = 1/4, P(F) =1/2 and P(E and F) = 1/8 then P(E or F)=?
    a. 2/8
    b. 3/8
    c. 5/8
    d. None of these

6. If A & B are two independent events then P(AB)= _____
    a. P(A)
    b. P(A) + P(B)
    c. P(A).P(B)
    d. None of these

7. If A and B are independent then P(A/B) = ?
    a. A
    b. AB
    c. B
    d. None of these

8. If A and B are two mutually exclusive events then P(AUB)= P(A) +P(B) , the theorem is known as
    a. Addition theorem of probability
    b. Total theorem of probability
    c. Multiplicative theorem of probability
    d. None of these

9. Level of significance is the probability of_____
    a. Type- I Error
    b. Type- II Error
    c. Power function
    d. All of these

10. If β is the probability of type II error , then 1- β is called _____ of the test
    a. Type I error
    b. Power function
    c. Critical region
    d. None of these

11. If the population is normal and infinite , Sample size small and variance of the population unknown. H_a may be one- sided or two- sided , in such situation the test statistic is
    a. $t = \dfrac{\bar{x}-\mu}{\sigma\sqrt{n}}$

    b. $z = \dfrac{\bar{x}-\mu}{\sigma\sqrt{n}}$

    c. both a) & b)
    d. None of these.

12. For Binomial Distribution mean and variance are____ & _____ respectively.
    a. np & pq
    b. pq & npq
    c. np & npq
    d. None of these

13. Name the distribution whose mean and variance are equal.
    a. Binomial
    b. Poisson
    c. Normal
    d. Rectangular

14. A _____ distribution has mean= median=mode
    a. Symmetrical
    b. Non-symmetrical
    c. Positive Skewed
    d. All of these

15. If X follows chi-square distribution with n degrees of freedom then mean of x is___
    a. n
    b. 2n
    c. 3n
    d. 4n

16. The test is said to be two-tailed test if $H_o=\mu_{H0}= 100$ and alternative hypothesis is _____.
    a. $H_I> \mu_{H0}$
    b. $H_I< \mu_{H0}$
    c. $H_I\neq \mu_{H0}$
    d. None of these

17. t-test can be applied only when the population is____
    a. Binomial
    b. Poisson
    c. Normal
    d. None of these

18. Sample mean, sample variance etc. are termed as
    a. Parameter
    b. Statistics
    c. Both a &b
    d. None of these

19. OLS estimator is
    a. Best linear unbiased estimator
    b. Consistent
    c. Equal to maximum likelihood estimator
    d. All of these

20. If one of the regression coefficient is greater than 1 , then the other must be____
    a. Equal to 1
    b. Less than 1
    c. Greater than 1
    d. None of these.

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Course : ....

Semester : .... Roll No : ....

Enrollment No : .... Course code : ....

Course Title : ....

Session : .... 2017-18 .... Date : ....

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Full Marks	Marks Obtained
20	