

For Candidates Admitted From 2018

2018 MST 22C ROLL NO.....
M.Sc. DEGREE EXAMINATIONS, APRIL 2019
SEMESTER : II STATISTICS
DISTRIBUTION THEORY

Time: 3 Hrs Max.Marks:75

PART - A (10 X 2 = 20)
ANSWER ALL THE QUESTIONS

1. Define continuous distribution function.
2. Define discrete random variable.
3. Define Hyper - Geometric distribution.
4. Define negative binomial distribution.
5. Define Cauchy distribution with parameters λ and μ .
6. Define weibul distribution.
7. Define non central F distribution.
8. Write the distribution of sample correlation coefficient when $\rho = 0$.
9. Obtain cumulative distribution of a single order statistic.
10. In the case of order statistic define sample median.

PART - B (5 X 5 = 25)
ANSWER ALL THE QUESTIONS

11. a. Obtain the distribution function of the Quotient of two random variables.
(or)
b. If X is binomially distributed with parameters n and p find the distribution of $Y = n - X$.
12. a. If X and Y are independent poisson variates such that $p(x = 1) = p(x = 2)$ and $p(y=2) = p(y=3)$ find $v(x - 2y)$.
(or)
b. Obtain MGF of Power series distribution.

13. a. State and prove additive property of gamma distribution.
(or)

b. Obtain mean and variance for exponential distribution.

14. a. Explain non central t distribution.

(or)

b. Obtain mean and variance for non central F distribution.

15. a. Show that $Y_1 = \min (X_1, X_2, \dots, X_n)$ is exponential with parameter $n\lambda$ if and only if each X_i is exponential with parameter λ .

(or)

b. Derive the joint p.d.f of two order statistics.

PART - C (3 X 10 = 30)

ANSWER ANY THREE QUESTIONS

16. Let $X \sim N(0,1)$ and $Y \sim N(0,1)$ independent random variables find

the distribution $\frac{X}{Y}$.

17. Find the MGF of $X - np / \sqrt{npq}$ also obtain the limiting form as $n \rightarrow \infty$.

18. Prove for Normal distribution all odd order moments vanish.

19. Derive the pdf of non central F distribution.

20. Show that for a random sample of size 2 from $N(0, \sigma^2)$

$$E[X_{(1)}] = -\frac{\sigma}{\sqrt{n}}$$

For Candidates Admitted From 2015-2017

2015 MST 43E

ROLL NO.....

M.Sc. DEGREE EXAMINATIONS, APRIL 2019

SEMESTER : IV STATISTICS

ECONOMETRICS

Time: 3 Hrs

Max.Marks:75

PART - A (10 X 2 = 20)

ANSWER ALL THE QUESTIONS

1. Define econometrics.
2. What is meant by forecast error?
3. Write down the assumptions of OLS estimator.
4. State any two properties of OLS estimator.
5. Mention the significance of autocorrelation in econometrics.
6. Define multi-collinearity.
7. Define simultaneous equation model.
8. State any two properties of 2SLS estimators.
9. Write down any two planning strategies in India.
10. Define Mahalanobis one sector model.

PART - B (5 X 5 =25)

ANSWER ALL THE QUESTIONS

11. a) Describe the nature and scope of econometric analysis.
(or)
b) Discuss the estimation of the econometric model.
12. a) Distinguish between homoscedasticity and heteroscedasticity.
(or)
b) Discuss the method of generalized least squares.
13. a) Discuss the effect of auto correlated values of errors term on OLS estimator.
(or)
b) Describe the solution for multi-collinearity.
14. a) Describe the order condition for identification.
(or)

b) Describe the restrictions on the relative values of two or more parameters.

15. a) Describe Domar model.

(or)

b) Describe Mahalanobis two sector model of India in planning.

PART - C (3 X 10=30)

ANSWER ANY THREE QUESTIONS

16. Explain specification of the mathematical model of consumption.
17. i) Prove that the least square estimators are unbiased estimators.
ii) Prove that ordinary least square estimators are BLUE.
18. Describe autocorrelation. Also explain anyone test procedure for the presence of the Autocorrelation.
19. Describe in detail about two stage least square estimator.
20. Explain similarities between Mahalanobis and Harrod-Domar models.

For Candidates Admitted From 2018-

2018 MST 21C

ROLL NO.....

M.Sc. DEGREE EXAMINATIONS, APRIL 2019

SEMESTER : II

STATISTICS

SAMPLING THEORY

Time: 3 Hrs

Max.Marks:75

PART - A (10 X 2 = 20)

ANSWER ALL THE QUESTIONS

1. Write any two advantages of sample surveys over census survey.
2. In systematic sampling prove sample mean is an unbiased estimate of population mean.
3. Distinguish between simple random sampling and pps sampling.
4. By Lahiri's method how will you select a sample?
5. Define product estimator.
6. What do you mean by bias of Ratio estimators?
7. Define cluster.
8. Give any two advantages of cluster sampling.
9. What is sub sampling?
10. Write the cost function for two stage sampling with equal first stage units.

PART - B (5 X 5 = 25)

ANSWER ALL THE QUESTIONS

11. a. Why we are going for sampling?
(or)
b. In SRSWOR find the variance of the sample mean.
12. a. Explain gain due to PPS sampling with replacement.

(or)

b. Explain the method of cumulative total.

13. a. Obtain approximate variance for Ratio estimator.

(or)

b. Explain Regression Estimator

14. a. Explain cluster sampling for proportions.

(or)

- b. Write a note on Relative efficiency of unequal cluster sampling.
15. a. Estimate the mean and variance of two stage sampling with equal first stage units.

(or)

b. Explain three sampling PPS sampling.

PART - C (3 X 10 = 30)

ANSWER ANY THREE QUESTIONS

16. Compare simple random sampling with stratified random sampling and systematic Random sampling.
17. How will you select a PPS sample with out replacement?
18. Compare Ratio estimator with mean per unit.
19. Estimate mean and variance for equal cluster sampling.
20. For two stage sampling, with equal first stage units estimate the mean and variance.

For the Candidates Admitted From 2015-2017

15MST23C

M.Sc DEGREE EXAMINATIONS, **APRIL 2019**
SEMESTER-II STATISTICS
STATISTICAL QUALITY CONTROL & RELIABILITY

Time: 3 Hrs

Max Marks: 75

Part A (10 X 2 = 20)

Answer all questions

1. Write the control limits of np chart.
2. Write the formula for one sided upper and lower Cusums.
3. What do you mean by EWMA?
4. Define Specification limits.
5. Write the formula for AOQ function for a Single sampling plan.
6. Write the formula for ATI function for a Single sampling plan.
7. What is the purpose of MIL STD 414?
8. Write the formula for acceptance and rejection numbers for a sequential sampling plan.
9. Define MTBF.
10. Find MTTF if $Z(t) = bt$, $b > 0$.

Part B (5 X 5 = 25)

Answer all the questions

11. a. Explain the types of Control Charts.
(or)
b. Describe the V-mask procedure.
12. a. Explain the capability indices.
(or)
b. Write the uses of Process capability analysis.
13. a. Explain the effect of changing the acceptance number on the OC curve.
(or)
b. Derive the ATI for a Single sampling plan.
14. a. Explain CSP-1.
(or)
b. Write a short note on MIL STD 414.
15. a. Explain the generalized pattern of failure.
(or)
b. Find the MTBF of a linearly increasing hazard function.

PART C (3 X 10 = 30)

Answer any THREE Questions

16. Write the advantages of Control Charts.
17. Prove that $Z_i = \lambda x_i + (1 - \lambda)Z_{i-1}$ is the weighted average of all previous means.
18. Explain the procedure of Single sampling and Double sampling Plans.
19. Explain the sequential sampling plan for attributes. Also specify the acceptance and rejection criteria.
20. How will you find the reliability of a series system when
 - i. the units are independent.
 - ii. When the units are dependent.