



Reg. No. :

Name :

**First Semester M.A. Degree (CBSS – Supple. (One Time Mercy Chance)/
Imp.) Examination, October 2023
(2014 to 2022 Admissions)
ECONOMICS/APPLIED ECONOMICS/DEV. ECONOMICS
ECO1C03 : Quantitative Techniques for Economic Analysis**

Time : 3 Hours

Total Marks : 60

PART – A

Answer all the questions :

- If A is a skew symmetric matrix, then A^2 is a
 - Identity matrix
 - Skew symmetric matrix
 - Null matrix
 - Symmetric matrix
- If A and B are square matrices then $(AB)^t =$
 - $B^t A^t$
 - $A^t B^t$
 - BA^t
 - $A^t B$
- Mean of a Poisson distribution is 4. Then the standard deviation is
 - 0
 - 2
 - 4
 - 8
- The process of making estimates about the population parameters from a sample is called
 - Statistical independence
 - Statistical hypothesis
 - Statistical inference
 - Statistical decision

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- The skewness of Chi square distribution is
 - Symmetric
 - Positive
 - Negative
 - Two tailed
- If $(1 - \alpha)$ increases the width of a confidence interval
 - Increases
 - Decreases
 - Remains unchanged
 - None
- A statistic is an unbiased estimators of a parameter if
 - $E(\text{statistic}) = \text{parameter}$
 - $E(\text{mean}) = \text{variance}$
 - $E(\text{variance}) = \text{mean}$
 - $E(\text{sample mean}) = \text{proportion}$
- As level of significance increases, the chance of type I error
 - Increases
 - Decreases
 - Remains unchanged
 - None

(8x0.5=4)

PART – B

Answer any 8 questions :

- Give an example for following matrices.
 - Symmetric matrix
 - Diagonal matrix
 - Upper triangular matrix
- $A = \begin{bmatrix} 2 & 4 \\ 3 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ -2 & 5 \end{bmatrix}$, $C = \begin{bmatrix} -2 & 5 \\ 3 & 4 \end{bmatrix}$
Find 1) $A - B$
2) $3A - C$.
- State multiplication theorem of probability.
- Define student t distribution with usual notations.



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- Define size and power of the test.
- State central limit theorem.
- Distinguish between confidence interval and confidence limit.
- Define consistency and efficiency of an estimator.
- Distinguish between critical region and critical value.
- Define null and alternative hypothesis.
- List the steps in testing of hypothesis.

(8x2=16)

PART – C

Answer any 4 questions :

- If $\begin{bmatrix} 2p+q & p-2q \\ 5r-s & 4r+3s \end{bmatrix} = \begin{bmatrix} 4 & -3 \\ 11 & 24 \end{bmatrix}$
Find $p + q - r + 2s$.
- Write a note on non-probability sampling techniques.
- Prove that $\det \begin{vmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{vmatrix} = (a-b)(b-c)(c-a)$.
- Is there any inconsistency in the statement, the mean of binomial distribution is 20 and its standard deviation is 4? If no inconsistency is found, what shall be the values of p, q and n?
- Write a note on uniform distribution.
- The proportion of women in a society is 0.48. Among 64 randomly selected people of the society. Let p_1 be the proportion of women. In another selection of 86 people, let p_2 be the proportion of women. Find
 - standard error of p_1
 - standard error of p_2
 - standard error of difference $(p_1 - p_2)$.

(4x5=20)

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PART – D

Answer any 2 questions :

- Prove that $\det \begin{vmatrix} -a^2 & ab & ac \\ ba & -b^2 & bc \\ ca & cb & -c^2 \end{vmatrix} = 4a^2b^2c^2$.
- A dice is thrown 6 times. What is the probability that there will be
 - no six
 - not more than one six
 - more than four six?
- Based on information, 1000 randomly selected fields about the tenancy status of the cultivation of these fields and the use of fertilizers, collected in an agro-economic survey the following classification was notes.

Use of fertilizers	Tenancy status		Total
	Owned	Rented	
Using fertilizers	416	184	600
Not using fertilizers	64	336	400
Total	480	520	1000

Carry out chi square test as per testing procedure.

- Write a note on normal distribution.

(2x10=20)