

4.	$A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \\ 2 & 2 \end{bmatrix}$ Let	$\begin{bmatrix} 2 \\ 2 \\ 1 \end{bmatrix}$. Then the matrix A	S is		
	(A Singular	TEST		~	
) (B) Diagonal (C) Skew-symm (D Symmetric)	petric			5
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	CV)	S		ATES	· · · · · · · · · · · · · · · · · · ·
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- 5. Let A be a square matrix. If $A^T = A$ then the matrix A is
 - (A Symmetric
 -) (B) Skew-symmetric
 - (C) Diagonal
 - (D Zero
 -)

Let

^{0]} Then the matrix A

4' i: a

- A Zero matrix
-) (B) Unit matrix
- (C) Symmetric matrix
- (D Skew symmetric natrix
- 7. The rank of the matrix $A = \begin{bmatrix} 13451 \\ 0 \end{bmatrix}$ is
 - (A 2

)

-) (B) 5
- (C) 1
- (D 0)

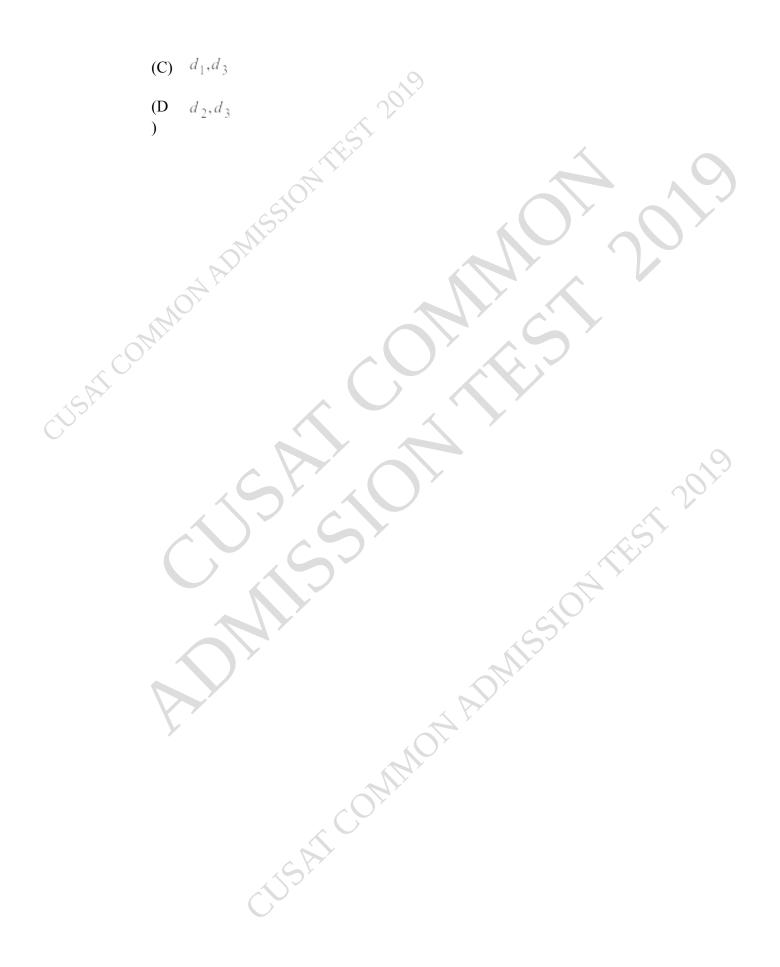
- 8. The Eigen values of a diagonal matrix
- d_3 are

 d_1 0 2019

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- (A d_1, d_2, d_3)
- **(B)** d_1, d_2

6.



- (12-1|)(-200|) $\dot{\zeta}$ is Product of the Eigen values of the matrix 9.
 - (A

1

0

)

- (A) (B) (C) (D 5 10
- Sum of the Eigen values of the matrix $A = \begin{pmatrix} 111 \\ 122 \end{pmatrix}$ 10.

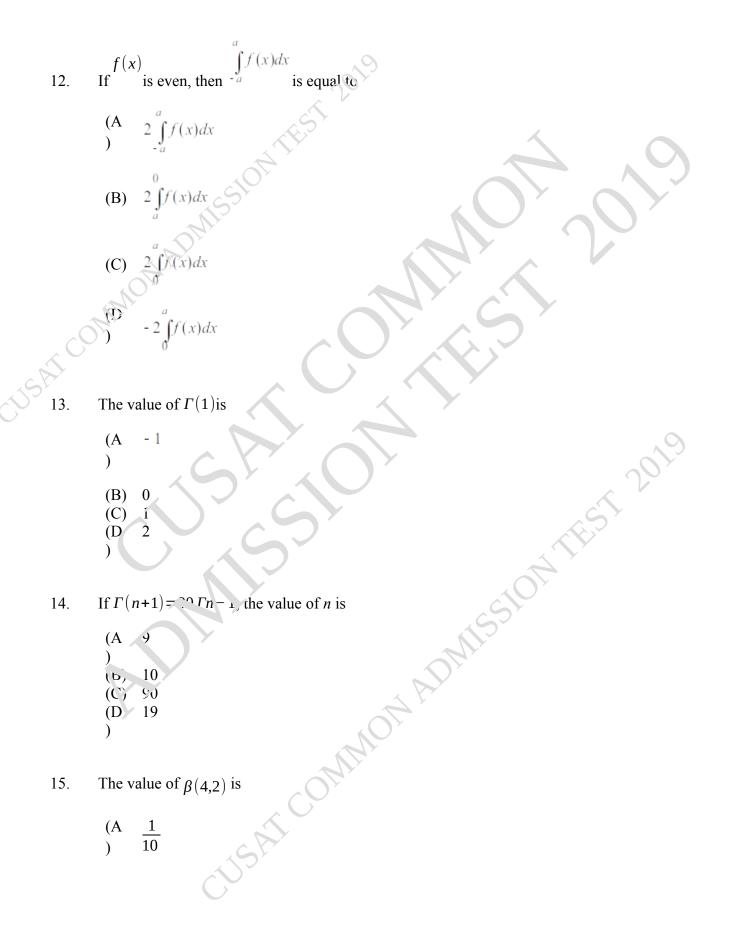
is

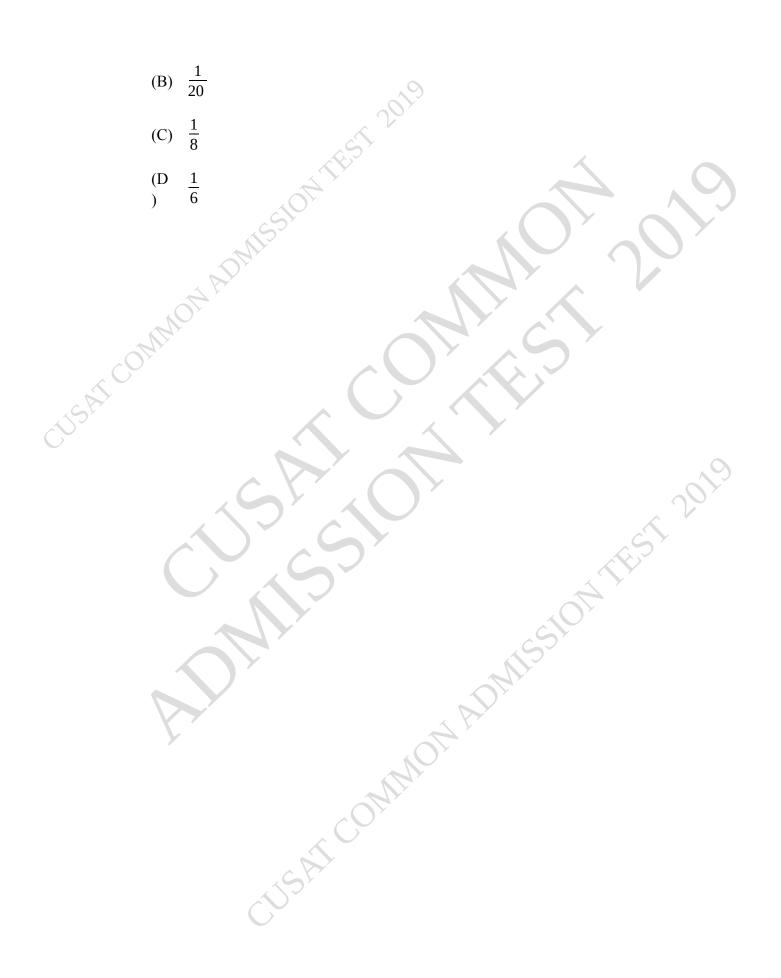
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- (A 3) (B) (C) (D 6 5 4)
- $\partial(x, y)$ If $x = r \cos \theta$ $-r \operatorname{SI} 1\theta$, then 6 11. ic equal to

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- (A)
- (B) r
- (C) $\sin \theta$
- າsheta(D





16. Which one of the following is not correct?

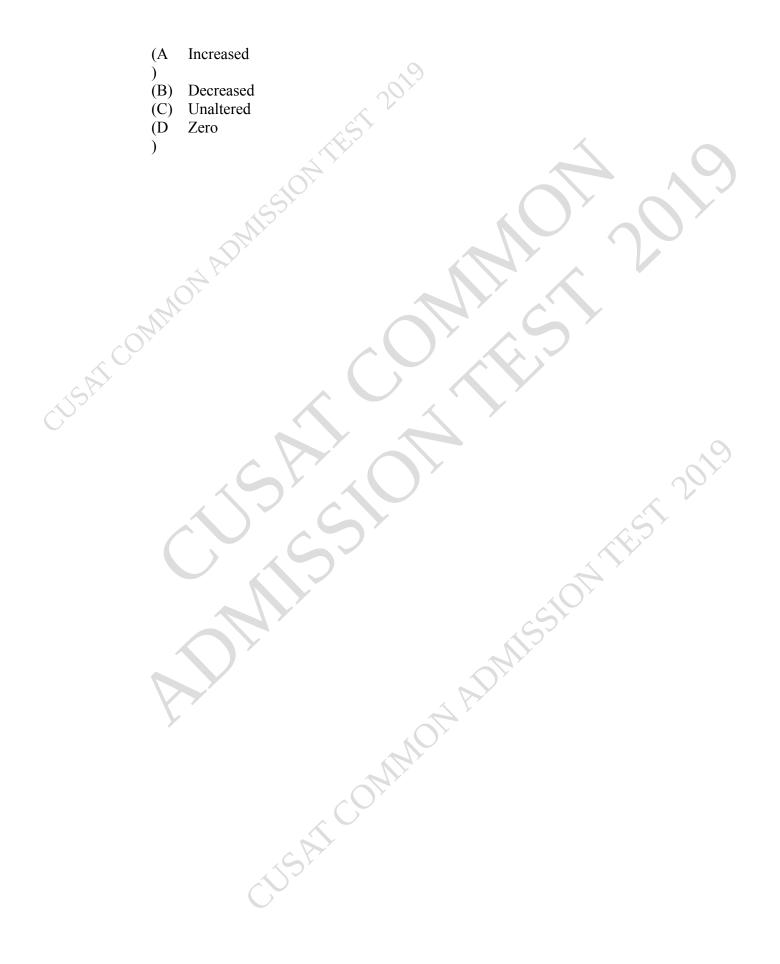
- $\begin{pmatrix} \mathsf{A} & \Gamma\left(\frac{1}{2}\right) = \sqrt{\pi} \\ \end{pmatrix}$
- (B) $\beta(m,n)=\beta(n,m)$
- (C) $\Gamma n+1=(n-1)\Gamma n$

$$(D \qquad \beta(m,n) = \frac{\Gamma_m \Gamma_n}{\Gamma_m + n}$$

- 17. Which one of the following is not a two dimensional diagram?
 - (A Square diagram
 - (B) Multiple bar diagram
 - (C) Rectangular diagram.
 - (D Pie-chart
 -)
- 18. The A.M of two on bers is 6.5 and their G.M is 6. The two numbers are

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- (A 9,6
-) (B) 2,5
- (B) 2, 5(C) 7, 6
- (D 4, 9)
- Ì
- 19. Mea. deviation is minimum when deviations are taken from
 - (A Mean
 -)
 - (B) Median
 - (C) Mode
 - (D Zero
 -)
- 20. If each value of a series is multiplied by a constant C, the coefficient of variation as compared to original value is



- 21. If $A \subset B$, the probability, P(A/B) is equal to
 - (A Zero)
 - (B) One
 - (C) P(A)/P(B)
 - $(\mathbf{D} P(B)/P(A))$

22. If a number is selected randomly from each or the two sets

1, 2, 3, 4, 5, 6, 7, 8

2, 3, 4, 5, 6, 7, 8, 9

then the probability that t^{1} e sum of the numbers is equal to 9 is

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- (A 8/91)
- (B) 7/7
- (C) 14/c¹

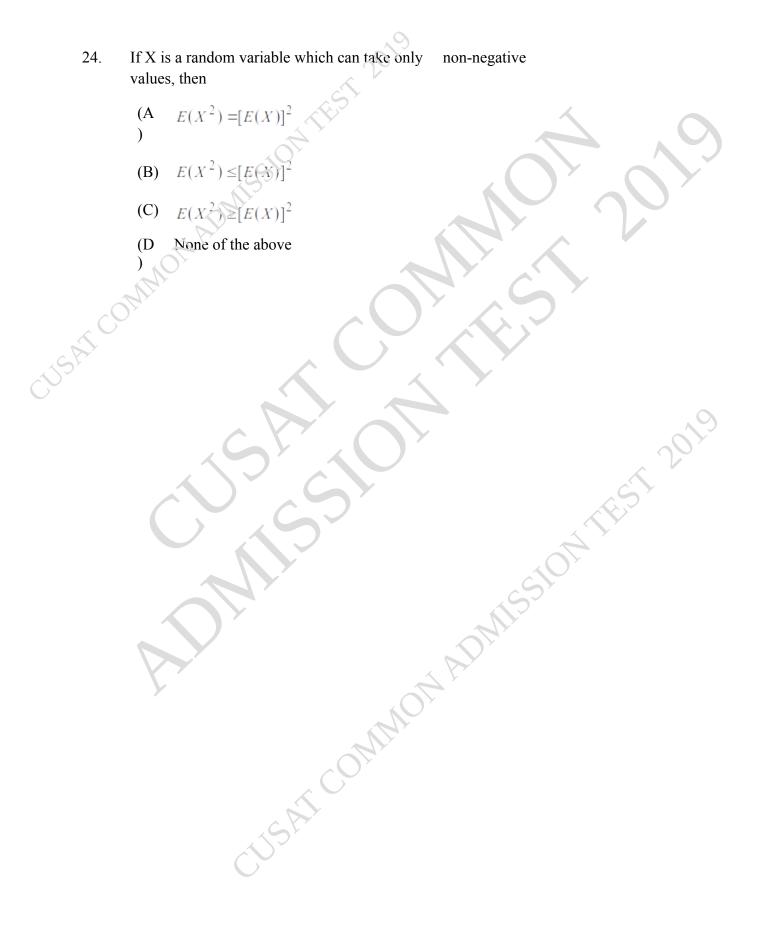
23. If P(A | B) = 1/4 and P(B | A) = 1/3, then P(A)/P(B) is equal to

K

(!

- (A 3/4)
- (B) 7/12
- (D) //12
- (C) 4/3
- (D 1/12

)



25. Negative binomial distribution, NB(x; r, p) for r=1 reduces to

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(A Binomial distribution

)

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- (B) Poisson distribution
- (C) Hypergeometric distribution
- (D Geometric distribution

- 26. An approximate relation between Q.D and S.D of a normal distribution is
 - $(A \quad 5Q.D = 4 S.D$
 -)
 - (B) 4 Q.D = 5 S.D
 - (C) 2 Q.D = 3 S.D
 - $(D \quad 3 Q.D=2 S.D)$

 χ^2

(B) $\chi^2 = n$ (C) $\chi^2 = n - 2$

=m - 1

 $\chi^2 = 1/(n-2)$

)

(A

(D)

27. Mode of the chi-square distribution with n.d.f li at the point

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- 28. Stratified sampling belongs to the category of
 - (A Judgement sampling

- (B) Subjective sampling
- (C) Controlled sampling
- (D Non-random sampling
-)

)

)

- 29. Systematic sampling means
 - (A Selection of *n* contiguous units
 - (B) Selection of n units situated at equal distances
 - (C) Selection of *n* largest units
 - (D) Selection of n middle units in a roughce
- 30. If an estimator T_n of computation parameter 2 converges in probability to θ as *n* tends to infinity then T_n is said to be

20

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- (A Sufficient
-)
- (B) Efficient
- (C Corsistent (D Unbiased
- (D τ)
- 31. Sampi medi, n as an estimator of population mean is always
 - (A Unbiased
 -)
 - (B) Efficient
 - (C) Sufficient
 - (D None of the above
 -)
- 32. The maximum likelihood estimators are necessarily
 - (A Unbiased

)

 (B) Sufficient (C) Most efficient (D Unique 	2019
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(B) Sufficient (C) Most efficient (D Unique)	C III
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- 33. Degree of freedom is related to
 - (A Number of observations in a set
 -)
 - (B) Hypothesis under test
 - (C) Number of independent observations in a set
 - (D None of the above
 -)

34. The decision criteria in SPRT depends on the functions 5.

- (A Type I error
- (B) Type II error
- (C) Type I and II errors
- (D None of the two types of error

35. Kolmogorov-Smirnov test 's a

- (A One left-sided tes
-)

)

)

- (B) One right in d test
- (C) Two-sided test
- (D A.' of the above
- 36. If the two lines of agreation are coincident the relation between the two regration coefficients is

20

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(A
$$\beta_{YX} = \beta_{XY}$$
)
(E) $\beta_{YX} \cdot \beta_{XY} = 1$
(C) $\beta_{YX} \leq \beta_{XY}$
(D $\beta_{YX} = -\beta_{XY}$)

37. If $\rho = 1$, the relation between the two variables X and Y is

(A Y is proportional of X

-)
- Y is inversely proportional to X Y is equal to X None of the above (B)

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- (C)
- (D
-)

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- 38. The consistent increase in production of cereals constitutes the component of the time series
 - (A Secular trend
 -)
 - (B) Seasonal variation
 - (C) Irregular variation
 - (D All of the above
 -)

39. Combining of two index numbers series having different base periods into one series with common base period is known as

- A Splicing
- (B) Base shifing
- (C) Both (A) and (B)
- (D Neither (A) nor (B)
- 40. The graph of the proportion of defective of in the lot against average sample number is

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- (A OC curve
-)
- (P) A.S.N curve
- (C, Power curve
- (D All of the . bove
-)
- 41. In the analysis of data of RBD with b block and v treatments, the error argrees of freedom are

(A
$$b(v-1)$$
)

- (B) v(b-1)
- (C) (b-1)(v-1)
- (D None of the above
-)

42. If two Latin Square are such that one can be obtained by interchanging the rows of one with columns of the other, then the Latin squares are said to be

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- (A Conjugate
-) (B) Self conjugate
- (C) Orthogonal
- (D Asymmetric

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- 43. The method of confounding is a device to reduce the size of
 - (A Experiments
 -)
 - (B) Replications
 - (C) Blocks
 - (D All of the above
 -)

44. If $X \sim b(n, p)$, the distribution of Y = (n - X) is

- (A b(n,1)) (B) b(n,x)(C) b(n,p)(D b(n,q) where q
- 45. If X is Poisson variate with paramete. ¹¹, the moment generating function of Poisson variate is

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- (A $e^{\mu t 1}$) (B) $e^{\mu (e^{t} - 1)}$ (C) $e^{\mu (e^{t} - 1)}$ (D) $e^{i\mu (e^{t} - 1)}$
- 46. The relation between the mean and variance of χ^2 with *n*.d.f is
 - (A Mean = 2 variance
 -)
 - (B) 2 mean = variance
 - (C) Mean = variance
 - (D None of the above



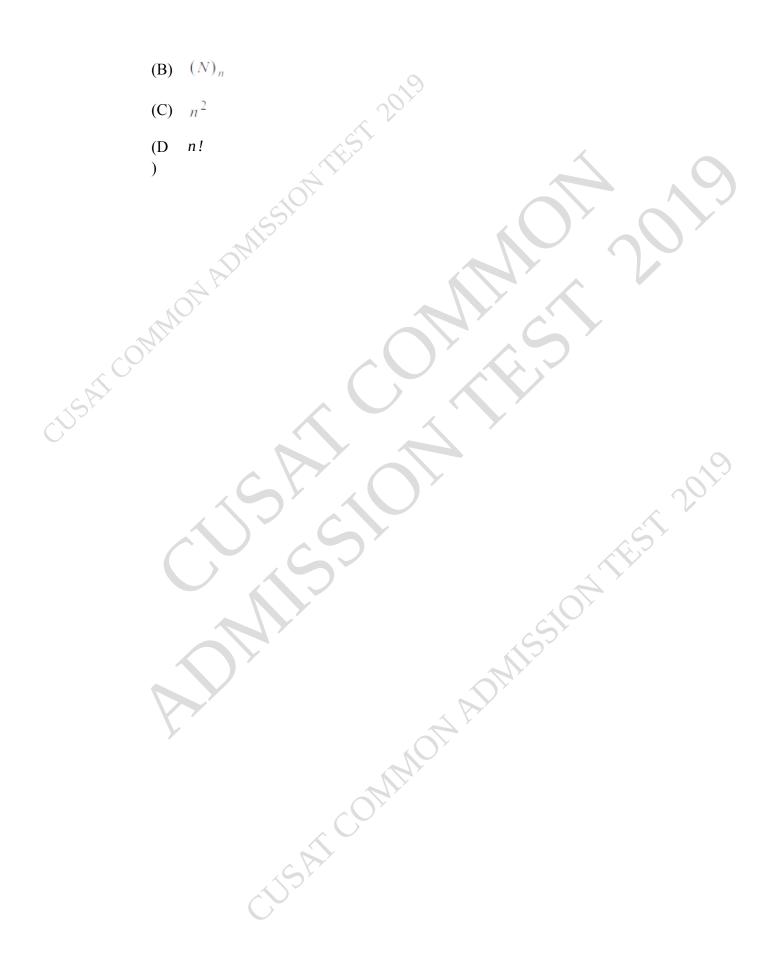
- If X and Y are distribution as χ^2 with d.f $n_1^{n_1}$ and $n_2^{n_2}$ 47. respectively, the distribution of the variate X/Y is
 - (A) $\beta_I(\frac{n_1}{2},\frac{n_2}{2})$ (B) (C) χ^2 with df ($n_1 - n_2$) All of the above (D
 - F-distribution curve in respect of tails 1.
 - Negative skewed (A
 -) Positive skewed (B)
 - Symmetrical (C)
 - None of the above (D
 -)
- $2 \log x$ where x is distributed as U(0,1)The variable 49. folle vs

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- F-distribut o. (A
-)

)

- distribution (B)
- (\mathbb{C}) -distribution
- Exponential distribution (D
- The number of possible samples of size nout of Npopulation 50. units without replacement is
 - (N) ¿ (A
 -)



- 51. Probability of drawing a unit at each selection remains same in
 - (A srswor
 -)
 - (B) srswr
 - (C) both (A) and (B)
 - (D None of (A) and (B)
 -)
- 52. If A_1, A_2, \dots, A_n is a random sample from a population
 - a sufficient statistic for σ^2 is
 - (B) $\sum X_i^2$

 $\sum X_i$

- (C) $\left(\sum X_i\right)^2$
- (D None of the abov.
-)
- 53. Mean squared error of an estimate r^{-n} of $\tau(\theta)$ is expressed as

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- (A $bias + var_{\theta}(T_n)$) (B) $[bias + var_{\theta}(T_n)]^2$ (C) $(b_{r}s_f)^2 + [var_{\theta}(T_n)]^2$ (D $(bias)^2 + var_{\theta}(T_n)$)
- 54. Rao- Blackwell theorem enables us to obtain minimum variance unbiased estimator through
 - (A Unbiased estimators
 -) (B) Complete statistics

	(C) (D)	Efficient statistics Sufficient statistics	2019			
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- If t is a consistent estimator of θ , then 55.
 - (A *t* is also a consistent estimator of)
 - t^2 is also a consistent estimator of θ (B)
 - t^2 is also a consistent estimator of θ^2 (C)
 - None of the above (D
- Formula for the confidence interval for the tio of variances of 56. two normal population involves
 - (A χ^2 - distribution)
 - **(B)** Fdistribution
 - *t*-distribution (C)
 - None of the above (D
- For the distribution $f(x, z) = \frac{1}{\theta}$; $0 \le x \le \theta$ a sufficient estimator 57.

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- for θ based on a sangle X_1, X_2, \dots, X_n is (A X_{n}/n
- $\sqrt{\sum X_i^2}$ (E)
- $\max(^{X_1,X_2,\ldots,X_n})$ (C)
- $\min(X_1, X_2, \dots, X_n)$ (D) 15AT

)

)

- 58. A confidence interval of confidence coefficient (1α) is best which has
 - (A Smallest width
 -)

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- (B) Vastest width
- (C) Upper and lower limits equidistant from the parameter

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(D One-sided confidence interval

- 59. If the variance of an estimator attains the Crammer-Rao lower bound, the estimator is
 - (A Most efficient
 -)
 - (B) Sufficient
 - (C) Consistent
 - (D Admissible
 -)
- 60. Power of a test is related to
 - (A type I error
 - A
 - (B) type II error
 - (C) type I and II errors both
 - (D None of the above

61. A test based on a test statistic is classified and

- (A Randomised test
-)

)

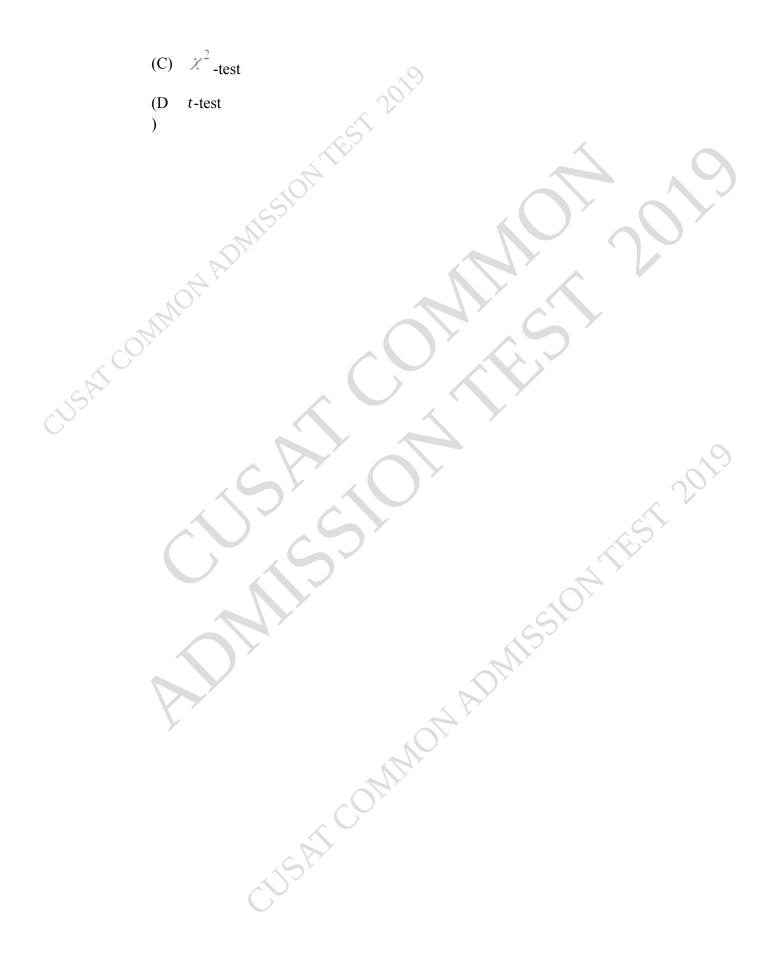
)

- (B) Non-randomised test
- (C) Sequential test
- (D Bayes lest
- 62. Neyman-Petton lemina provides
 - (A An un viased test
 -)
 - (b) A most powerful test
 - (C) An admissible test
 - (D Minimax test
 -)
- 63. Equality of several normal population means can be tested by

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- (A Bartlett's test
-)
- (B) F-test



- 64. If Var(X + Y) = Var(X Y), then the correlation between X and Y is equal to
 - (A

(B) 1/2

1

- (C) 1/4
- (D 0)

65. If one regression coefficient of the two regression lines is greater than unity, the other will be

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- (A > 1
- (B) 1

)

)

- (C) < 1
- (D 1/2
- 66. If for two attributes β and B the relation the attributes (α) and (β) are

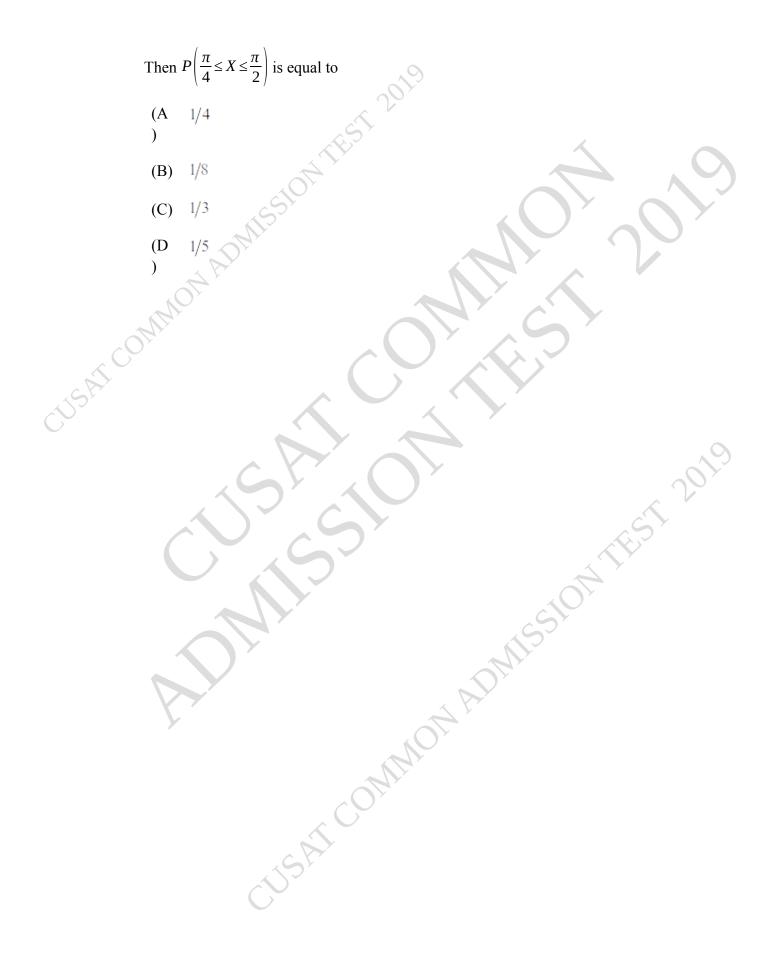
 $(\alpha\beta) =$

holds.

AN

- (A In ¹ependent
- (E) Positively associated
- (C) Negatively associated
- (D No conclusion
-)
- 67. The c.d.f of a random variable X is

$$F(x) = \begin{cases} 0x \le 0\\ \frac{x}{2\pi} 0 < x \le 2\pi\\ 1x > 2\pi \end{cases}$$



- 68. The Gamma distribution is
 - (A Positively skewed and leptokurtic
 -) (B) Negatively skewed and leptokurtic
 - (C) Positively skewed and nesokurtic
 - (D Negatively skewed and mesokurtic
 -)
- 69. If X follows exponential distribution with parameter θ , then $Y = e^{-\theta X}$ follow
 - (A Gamma distribution
 - (B) Uniform distribution
 - (C) Beta distribution
 - (D Cauchy distribution
- 70.

Let $X_1, X_2, ..., X_n$ be a condom comple from L(1, 2), then the consistent estimator of p(r - p) is

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 $(A \quad \overline{X})$ $(B \quad \overline{X})$

)

- (C) $\overline{X}(1-\overline{X})$
- (D *r*.**^**)
- 71. If a sequence of random variables is convergent in probability

tends

then as $\rightarrow \infty$, $P(|X_n - X| < \varepsilon)$ (A 1)

(B) 0

(C) ∞
 (D - ∞)
)

)

73

- 72. Define the events for a single roll of a die: $A = \{1, 3, 5\}; B = \{2, 4, 6\}; C = \{5, 6\}.$ Then
 - (A A and P are disjoint but not independent
 - (B) A and B are not disjoint but independent
 - (C) A and B are disjoint and independent
 - (D A and B are not disjoint and not independent

Given that $P(A \cup B) = 5/6$, $P(A \cap B) = 1/3$ and $P(\dot{B}) = 1/3$. Then the events A and B are

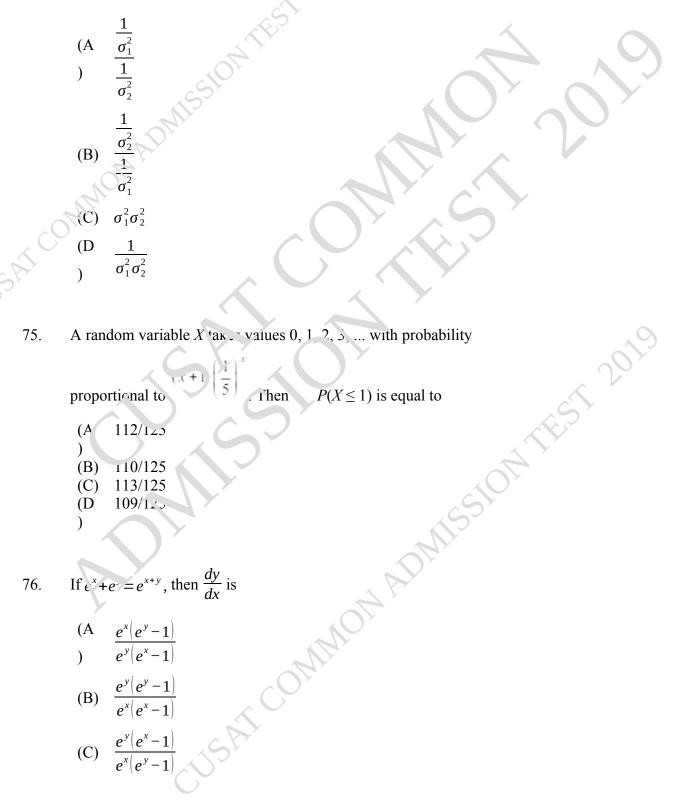
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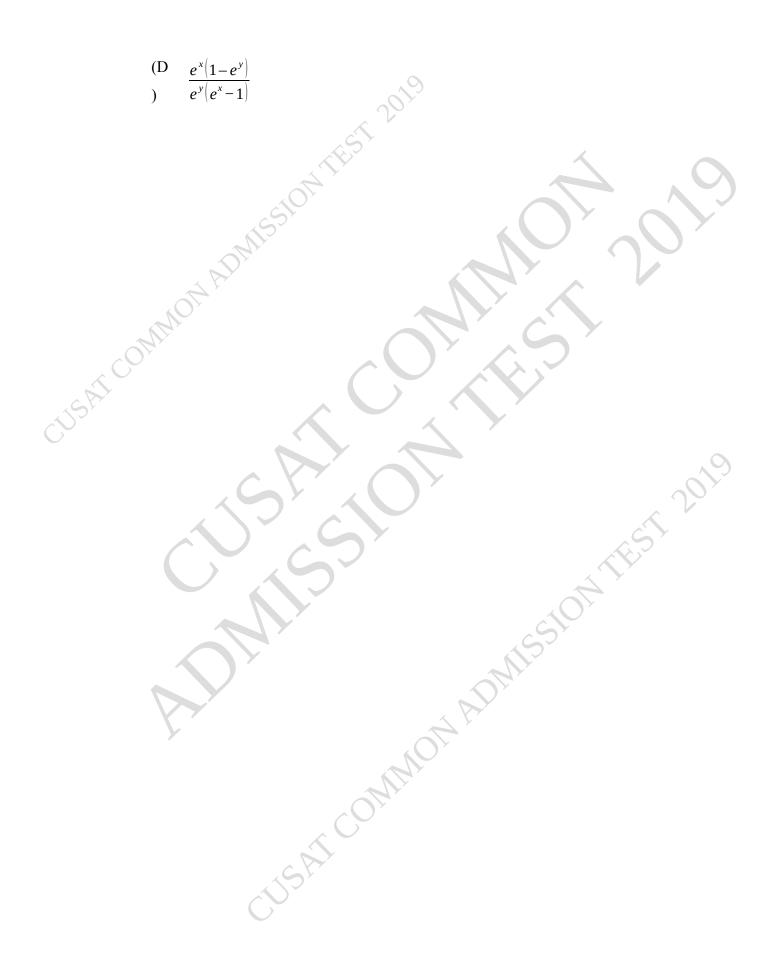
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- (A Dependent
-) (B) Indeper den^t
- (C) Mutually Exclusive
- (D C inditional events

Ì

74. If σ_1^2 is the error variance of design D_1 and σ_2^2 is the error variance of design D_2 utilizing the same experimental material, the efficiency of D_1 over D_2 is





- 77. Let F(x, y) be the joint p.d.f. of (X, Y). If a, b, c, d are any real numbers with a < b and c < d, then $P[a < X \le b, c < Y \le d]$ is equal to
 - (A F(b, d) + F(a, c) F(b, c) + F(a, d)) (B) F(b, d) + F(a, c) + F(b, c) + F(a, d)(C) F(b, d) - F(a, c) - F(b, c) + F(a, d)(D) F(b, d) + F(a, c) - F(b, c) - F(a, d))
- 78. A discrete r.v. X assumes three values 3, 0, 4 and $P(X = 0) = \frac{1}{2}$ and $E(X) = \frac{9}{8}$. Then P(X = 0) is (A 1/8)
 - (B) 2/8
 (C) 3/8
 (D 1/2)
 -)
- 79. A sample since, of the people of an area revealed that total number of women was 45% and the percentage of coffee drinkers ware 45 as a whole and the percentage of male coffee drinkers was 20. The percentage of female non-coffee drinkers is

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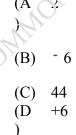
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- (A 10) (B) 15 (C) 1² (L 20)
- 80. The arithmetic and geometric mean of two observations are 5 and 4 respectively. Then the observations are
 - (A 2, 8
 -) (B) 4, 1
 - (C) 6, 4
 - (D 3, 7
 -)



- 82. If arithmetic mean and coefficient of variation of x are 20 and 20 respectively, what is the variance of y = 10 2x?
 - (A 64
 -)
 - (B) 16(C) 36
 - (D 84
 -)

83. If the range of X is 2, what is the range of -3X + 5.



84. Let X be a r.v. with cumulative distriction function (c.d.f.) F(x). Which one of the following is not the property of c.d.f.?

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- (A Bounded function
- (B) F is monotor ically no 1 decreasing
- (C) Foint function
- (D Right contin ous
-)

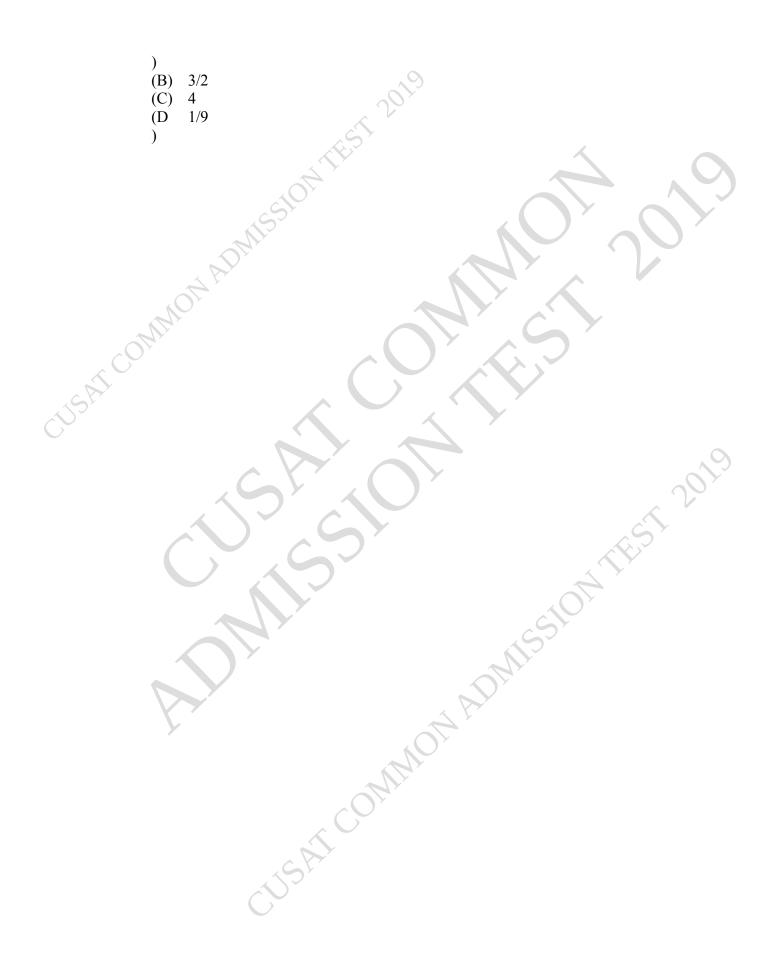
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85. 3^2 factor. 1 experiment means an experiment with

- (A 2 factors at 3 levels
-) 🗡
- (B) 3 factors at 2 levels
- (C) 3 factors at 3 levels
- (D 2 factors at 2 levels
-)

86. Let $X \sim$ Binomial (2, 1/2) and $Y = X^2$. Then E(Y) is

(A 2



- To compare several treatments, when the experimental units are 87. homogeneous, the appropriate design to be used is
 - Randomized Block Design (A
 -)
 - Latin Square Design **(B)**
 - Split Plot Design (C)
 - Completely Randomized Design (D)

A random variable X has mean 50 and variance \therefore By using 88. Chebyehev's inequality, the upper bound for $P[12-5\Im > 15]$ is

C

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3/4 (\mathbf{A}) 2/9 (B) (C)1/9 (D 4/9)

If $y = \sqrt{\sin x + \sqrt{\sin x} + \sqrt{\sin x}}$, then $\frac{dy}{dx}$ is

- (A r os x) 2vsinx x **(B)** 2y - 1cos x
- (C) v - 1sinx
- (D) v - 1

OMMONADMISSI If $x\sqrt{1+y}+y\sqrt{1+x}=0$, then $\frac{dy}{dx}$ is 90.

(A) $\frac{-1}{1+x}$ $\frac{-1}{1+y}$ (B) $\frac{-1}{(1+x)^2}$ (C) $\frac{(1-x)^2}{(1+y)^2}$ (D)



- 91. Two contrasts $c_i^T \hat{\beta}$ and $c_j^T \hat{\beta}$ are said to be orthogonal if
 - (A $c_i^T c_j = 1$) (B) $c_i^T c_j = 0$ (C) $c_i^2 = 1$ (D $c_j^2 = 0$)

92. Given the two line of regression as, 3X - 4Y + 8 = 0 and $4x^2 - 3Y = 1$, the means of X and Y are

A
$$\overline{X} = 4, \overline{Y} = 5$$

(B)
$$\overline{X} = 3, \overline{Y} = 4$$

(C)
$$\overline{X} = 4/3, \overline{Y} = 5/4$$

(D $\overline{X} = 3/4, \overline{Y} = 4/5$)

93. If X and Y are independent with common Exponential distribution with parameter O = 1, then the distribution of $(X \cdot Y)_{is}$

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- (A A Standard Stuciny distribution
- (B) An population
- (C) \land Stan lard Laplace distribution
- (D A Trandard Normal distribution
- 94. The producer's risk is
 - (A Probability of rejecting a good lot
 -) (B) Probability of accepting a good lot
 - (C) Probability of rejecting a bad lot
 - (D Probability of accepting a bad lot
 -)

)

95. The probability density function of X is $f(x) = \left| \frac{1}{4}, \wedge |x| < 2 \right|$.

0 otherwise

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Then P(2X+3 > 5) is equal to

- (A 1/3
-) (B) 1/2
- (C) 1/7
- (D 1/4

)

96. Let $\{X_n\}$ be a sequence of random variable. X_n converges almost surely to X if and only if

- $(A \quad P\left(\lim_{n \to \infty} X_n = X\right) = 0$
-) $(n \to \infty)$ (B) $P\left(\lim_{n \to \infty} X_n \neq X\right) = a; 0 < a < 1$
- (C) $P\left(\lim_{n \to \infty} X_n \neq X\right) = 1$
- $(D) \quad P\left(\lim_{n \to \infty} X_n = X\right) = 1$
- 97. The relation between the sure convergence (a.s), convergence in probability (p) and convergence in r^{th} mean (m) is

(A a.s $\implies m = p$) (B) $m = a.s \implies p$ (C) $s \implies p; m \implies p$ (D) $a.s \implies p; p \implies m$

- 98. If Type-I and Type-II errors are kept fixed then the power of the test increases,
 - (A if there is an increase of sample size
 -) (B) if sample size remains unchanged
 - (C) if there is a decrease of sample size
 - (D if the test is unbiased
 -)

- 99. A valid *t*-test to assess an observed difference between two sample mean value requires
 - (i) Both populations are independent
 - (ii) The observations to be sampled from normally distributed parent population
 - (iii) The variance to be the same for both populations

(A (i) and (ii)

)

(ii) and (iii) (B)

- (C) (i) and (iii)
- All the three conditions Ð

100.

A sufficient condition for an estimator T_n to be consident for θ is that

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 $Var(T_n) \to 0 \text{ as } \nu \to \infty$ (A) $E(T_r) - \int \mathrm{ds} \ \eta \to \infty$ **(B)** $\operatorname{Var}(T_n) / E(T_n) \to 0 \text{ as } n - \infty$ (C) (D $E(T_n) \rightarrow \theta$ and $\operatorname{Var}(T) = 0$ as $n \rightarrow \infty$)

101. The arithmetic man of three sizes 3, 4 and 2.5 weighed respectively v_2 the numbers 15, 5 and x is found to be 3. The value of x_{1}

(Δ 7) 9 **(B)** 10 (C) (D 8)

(C) 10
(D 8
)
102.
$$\lim_{x \to 4} \frac{x^2 - x - 12}{x - 4}$$
 is
(A 0
)

- (B) ∞
- 3 (C) (D 7
-)

The characteristics function of standard Cauchy distribution is 103.

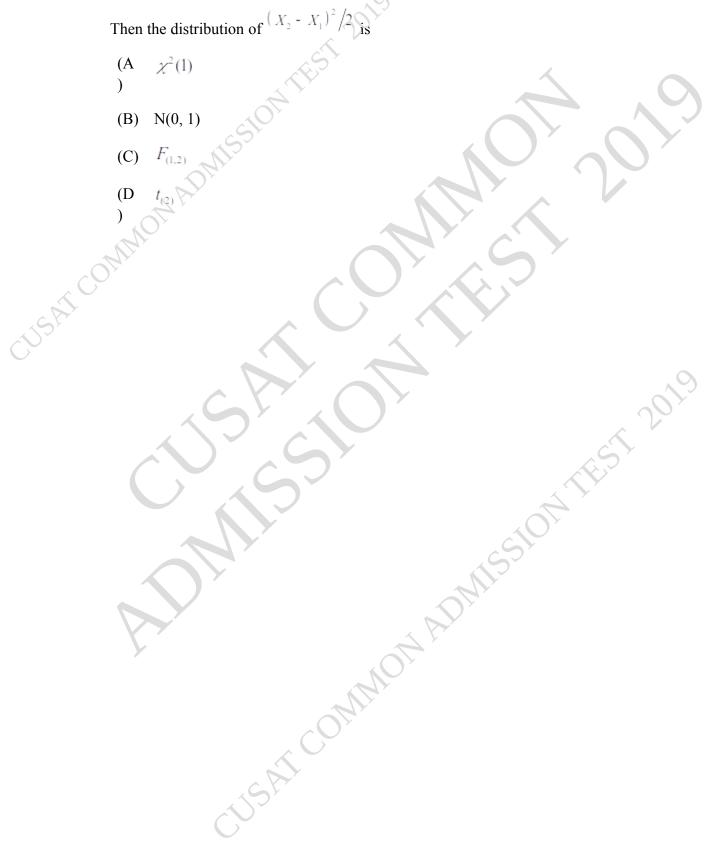
- e^{-t} (A)
- (B) e^{t}
- (C) ρ
- (D

A design is said to be orthogonal if 104.

- Treatment contrasts are c vrrelated with block cont. Sc (A
-) (B) Treatment contrasts ore uncorrelated
- Block contrasts are consolated (C)
- ON THIST 2019 Treatment contrast, are uncorrelated with block contrast (D)

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105. Let X_1 and X_2 are two independent standard normal variates.

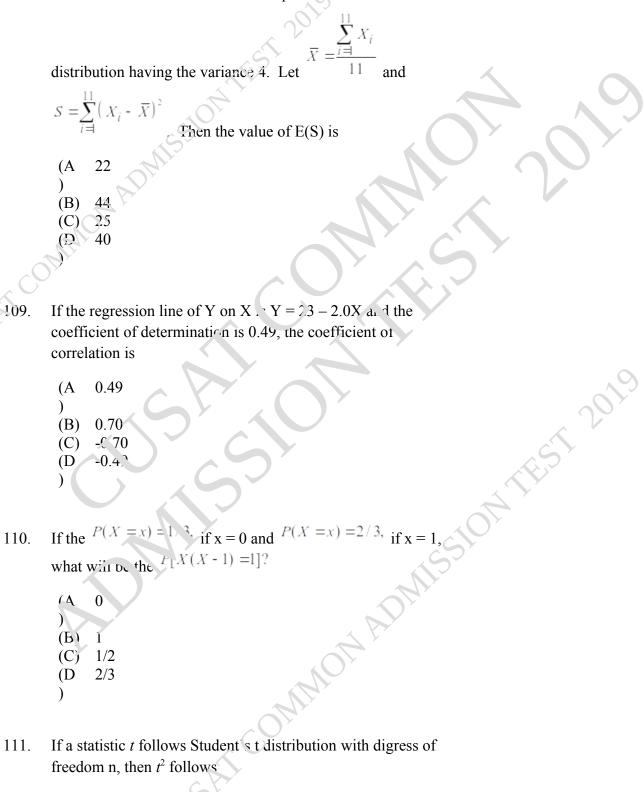


106. An unbiased coin is tossed twice. Let X and Y denote the number of times a head turns up and the number of times a tail turns up respectively. Pick out the wrong statement from the alternatives given below

(A
$$P(X > Y) > P(X < Y)$$

(B) $P(X + Y = 2) = 1$
(C) $P(X = 0) = P(Y = 0)$
(D $\hat{r}(X = Y) = 1/2$
)
107. Let X_1, X_2, \dots, X_n be a random s mple from $N(H, \hat{r})$
distribution, H and σ^2 be that a unknown. Define
 $S^2 = \sum_{i=1}^n (x_{(i)} - \pi)^2$. Which one is not a subside?
(A $\frac{n}{i=1}(x_i - \pi)^2$
(B) $\sum_{i=1}^n (x_i - \pi)^2/n$
(C) $\sum_{i=1}^n (x_i - \pi)^2/n$
(D x/S^2)

108. Let X_1, X_2, \dots, X_{11} be a random sample from a normal



(A Student's t-distribution with n^2 degrees of freedom)

- (B) Snedecor's F-distribution with (1, n) degrees of freedom
- (C) Snedecor's F-distribution with (n, 1) degrees of freedom

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- (D None of the above
-)

112. The number of non-negative variables in a basic feasible solution to a $m \times n$ transportation problem is:

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- (A mn
-)
- (B) m+n (C) m+n+1
- (D None of the above
- (D None of the above

- 113. Which of the following statements about confidence intervals is INCORRECT?
 - (A If we keep the sample size fixed, the confidence interval
 -) gets wider as we increase the confidence coefficient
 - (B) A confidence interval for a mean always contains the sample mean
 - (C) If we keep the confidence coefficient fixed, the confidence interval gets narrower as we increase the sample size
 - (D If the population standard deviation increases, the
 -) confidence interval decreases in width
- 114. If a primal LP problem has a finite solution, then he dual LP problem should have

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- (A finite solution
-) (B) infeasible solution
- (C) unbounded solution
- (D None of the all ve
-)

- 115. The dual of the primal maximization LP problem having m constraints and n non-negative variables should
 - (A have *n* constraints and *m* non-negative variables
 -)
 - (B) be a minimization LP problem
 - (C) both (A) and (B) \leq
 - (D None of the above
 -)
- 116. Consider the statements:

Maximum likelihood estimators are vlways unbiased.

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II. Maximum likelihood e timaters are always unique.

Which of the statements given above is/are correct?

- (A I only
-) (D) H 1
- (B) II only(C) Both (and 11)
- (D Neither I no: II
-)
- 117. Suppose X is a rendom variable taking values +1 and -1 only with probability c/s and c/6 respectively. Let $Y = X^2$. Then
 - (A c^{-1} , nd P(Y=0)=1) (B) c^{-1} end P(Y=1)=1(C) r=2 and P(Y=1)=1(L c=2 and P(Y=0)=1)
- 118. A sampling technique in which only the first unit is selected with the help of random numbers and the rest get selected automatically according to some pre-designed pattern is known as
 - (A stratified random sampling

- multi-stage sampling FEST 2019 (B)
- (C)
- cluster sampling systematic sampling (D

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- 119. Normal distribution is also known as
 - (A Gaussian distribution

)

- (B) Poisson distribution
- (C) Bernoulli's distribution
- (D Weighted average distribution
-)

120. In Poisson probability distribution, if value of + is integer, then distribution will be

(A bimodal

- (B) unimodal
- (C) positive modal
- (D negative modal)

121. Method in which previously colculated p dochuities are revised with new probabilities using other available information is based on

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- (A ur dating theorem
-)
- (P) revised theorem
- (C, Bayes theord.n
- (D dependen y the rem
-)

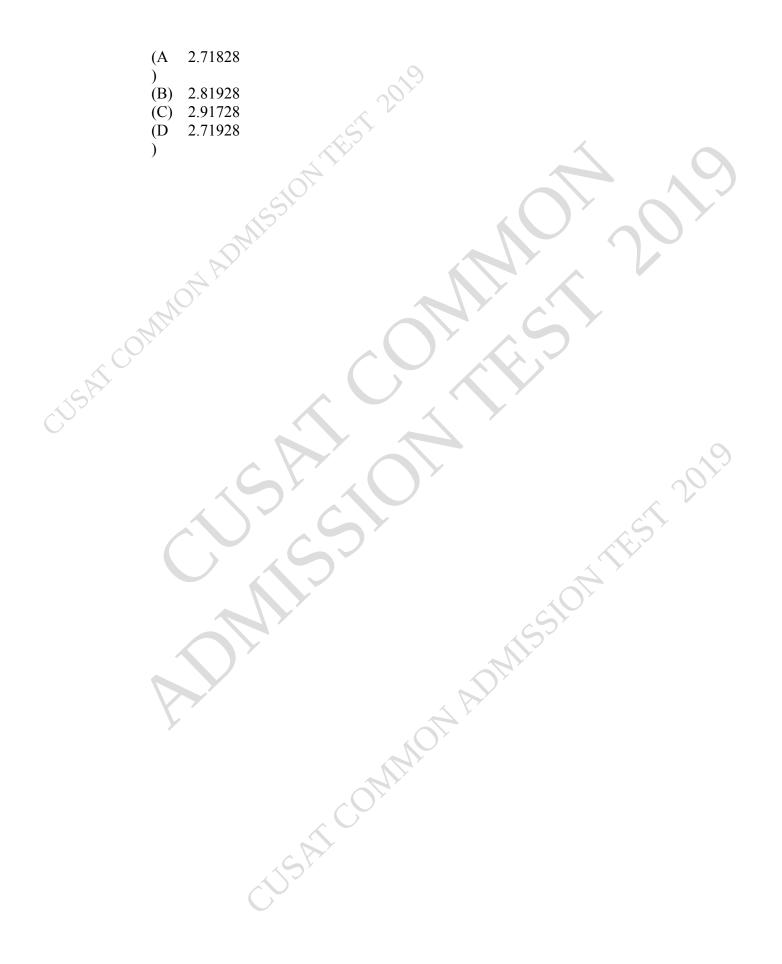
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122. If two vents X and Y are considered as partially overlapping events, then rule of addition can be written as

(A
$$P(X \text{ or } Y) = P(X) - P(Y) + P(X \text{ and } Y)$$

- (B) P(X or Y) = P(X) + P(Y) * P(X Y)
- (C) P(X or Y) = P(X) * P(Y) + P(X Y)
- (D P(X or Y) = P(X) + P(Y) P(X and Y)

123. If
$$\lim_{n \to \infty} \left(1 + \frac{1}{n} \right)^n = e$$
, then the value of *e* is



- The polynomial equation of the least degree having -1, 1, 2 and 124. 3 as roots is
 -) (B) $x^4 - 5x^3 + 5x^2 + 5x - 5 = 0$

 $(A \quad x^4 - 5x^3 + 5x - 6 = 0$

- $x^4 5x^3 + 5x^2 = 5x 6 = 0$ (C)
- (D $5x^2 - 5x^2 + 5x - 6 = 0$)
- A complex square matrix (a_{ij}) is said to be Hermitian matrix if 125. (for all i and j)

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- (A $a_{ij} = a_{ij}$)
- (B) a_{ii} =a
- (C) a (D a_{ii}

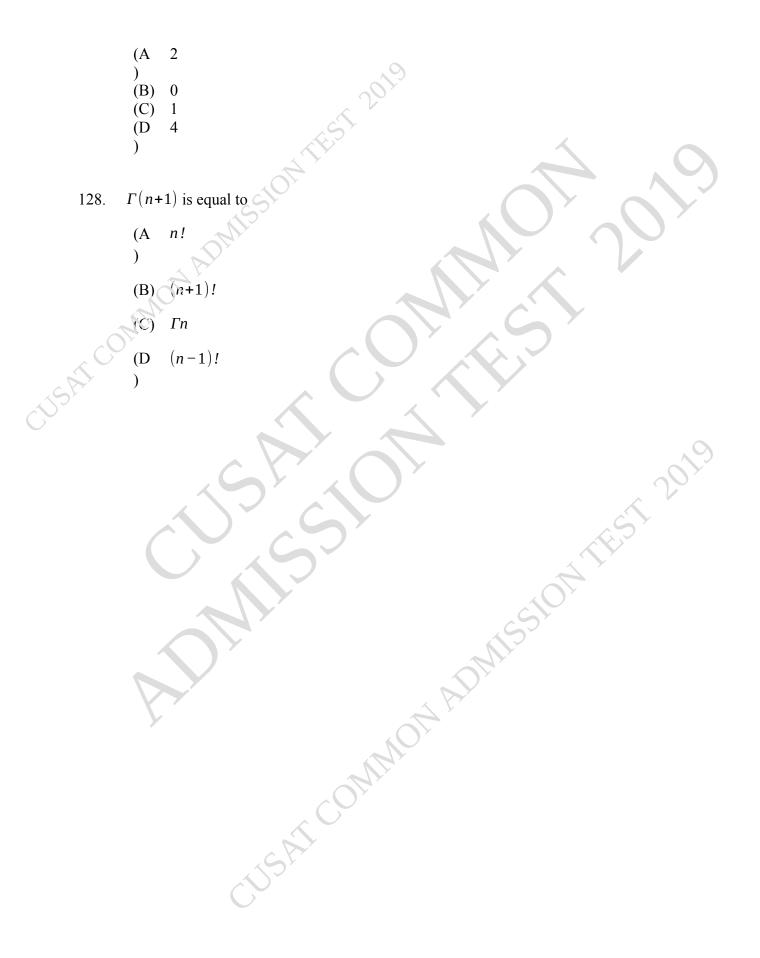
)

- COMMON ADMISSI If A is orthogonal, then |A| is 126.
 - (B) - 1 (C) ±1

+1

(D 0)

 $\int_{0}^{2} \int_{0}^{2} dx \, dy$ 127. is equal to



- 129. Histogram can be used only when
 - Class intervals are equal or unequal (A
 -) Class intervals are all equal **(B)**
 - Class intervals are unequal (C)

 - Frequencies in class interval are equal (D)
- If (X, Y) follows the bivariate N $(0,0,1,1,\rho)$, then the value bles X 130. + Y and X - Y are

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- Correlated with $\rho = \frac{1}{2}$ (A
- Independently distributed **(B)**
- Negatively correlated (C)
- None of the above (D
- 131. Bias of an estimator can u.
 - Positive (A
 -)
 - **(B)** Ne rative
 - Either positive cr negative (C)
 - Alw ays zero (L
 -)

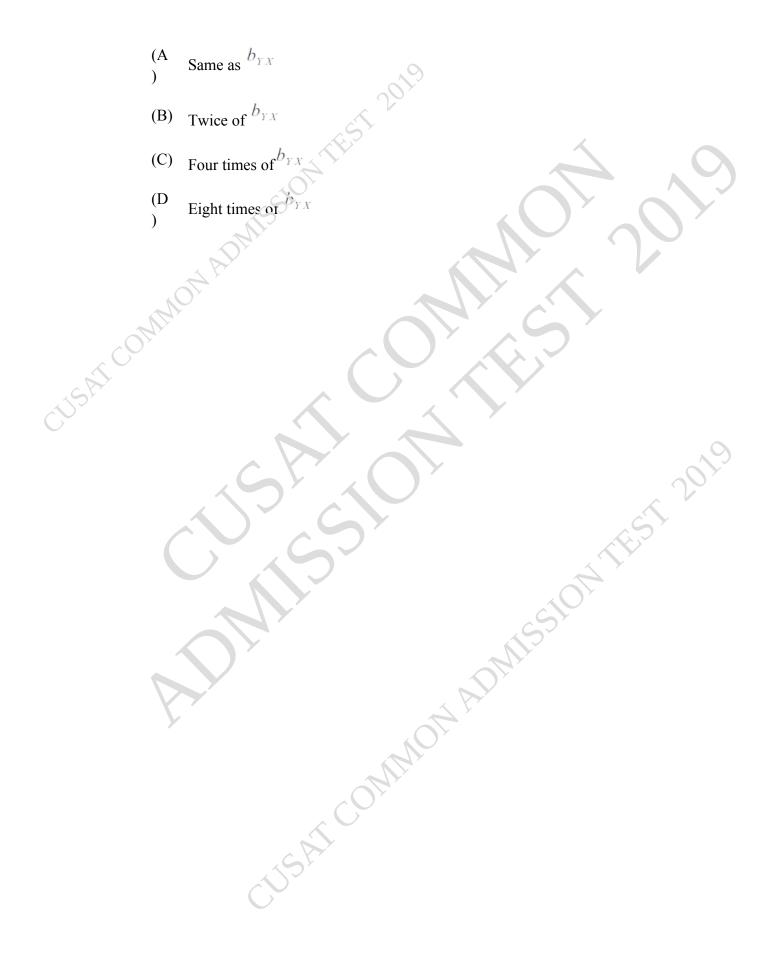
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)

Range of the veriance ratio F is 132.

(A to 1 **(B)** - ∞ to ∞ (C) 0 to 🕫 (D 0 to 1

If each value X is divided by 2 and Y is multiplied by 2, then 133. b'_{YX} by coded values is



- 134. If the index number is independent of the units of measurement, then it satisfies
 - (A Time reversal test
 -)
 - (B) Factor reversal test
 - (C) Unit test
 - (D All of the above
 -)
- 135. Variation due to assignable causes in the product occurs due to

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- (A Faulty process
- (B) Carelessness of operators
- (C) Poor quality of raw material
- (D All of the above

136. Missing observation in a CRL is to be

- (A Estimated
-)

)

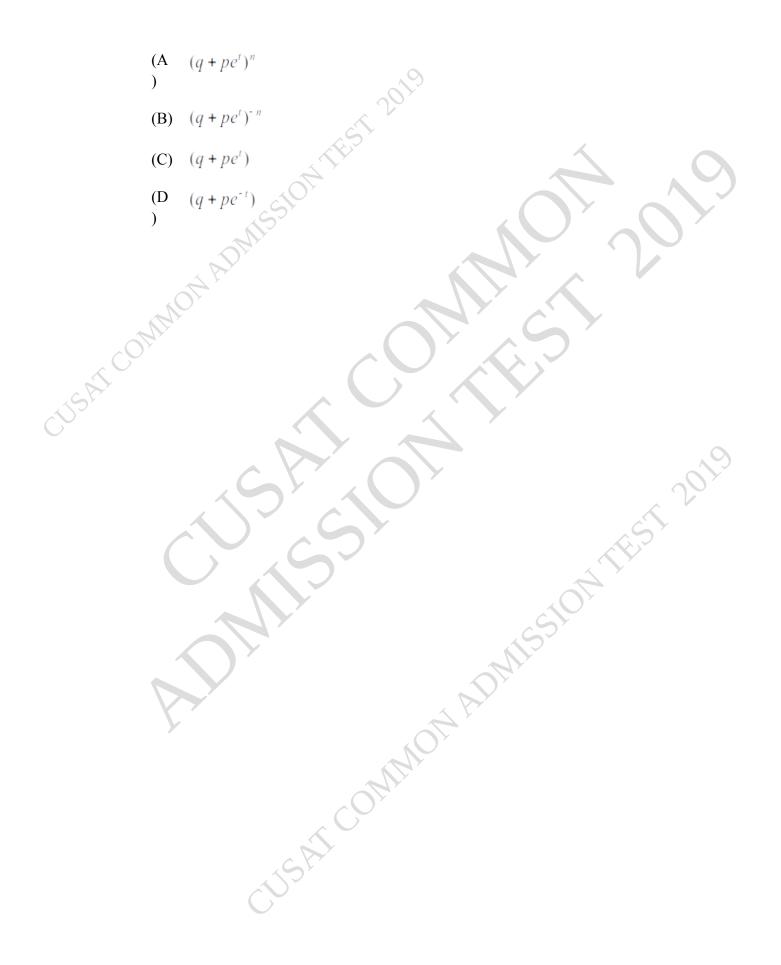
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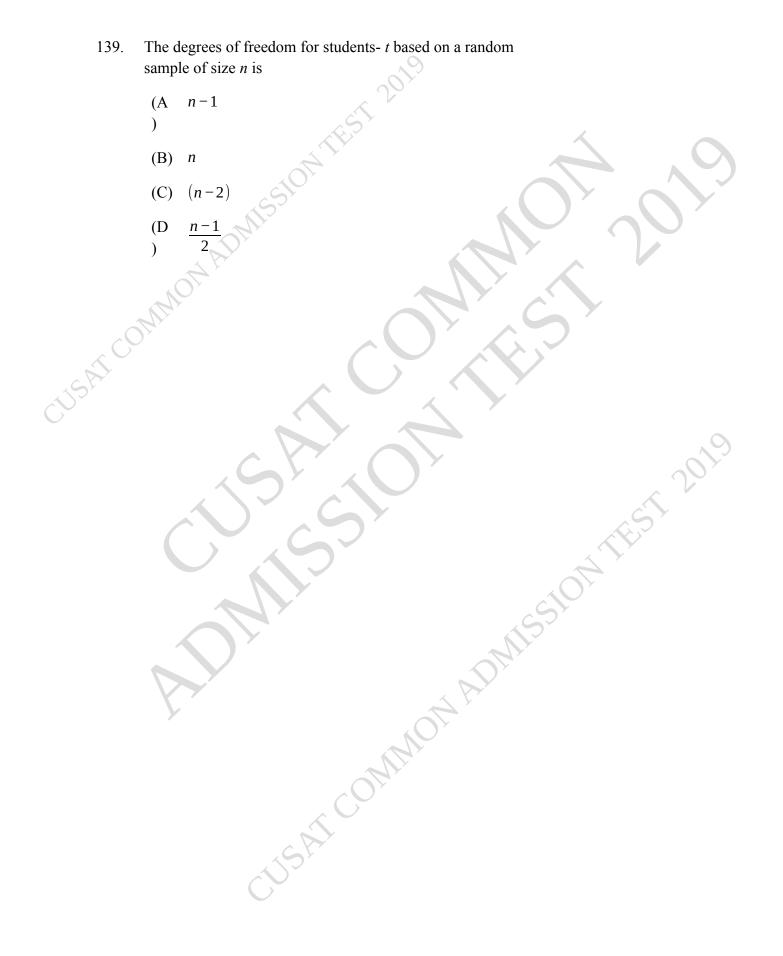
- (B) Deleted
- (C) Gurssed
- (D None of the above
- 137. If two events 1 and b are such that $A \subset B$ and $B \subset A$, the relation by vector P(A) and P(B) is

$$(\mathbf{A} \quad \mathbf{P}(\mathbf{A}) \leq \mathbf{P}(\mathbf{B})$$

(B)
$$P(A) \ge P(B)$$

- (C) P(A) = P(B)
- (D None of the above)
- 138. The moment generating function of the Bernoulli distribution is





- 140. If $X \sim b(n, p_1)$ and $X_2 \sim b(n_2, p_2)$, the sum of the variates
 - $(X_1 + X_2)$ is distributed as
 - (A Hypergeometric distribution
 -) (B) Binomial distribution
 - (C) Poisson distribution
 - (D None of the above
 - j so

141. Let $X \sim N(\mathcal{U}, \sigma^2)$. Then the central moments of dd order are

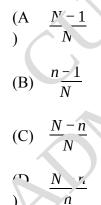
- One
- (B) Zero

)

- (C) Infinite
- (D Positive
- 142. If we have a sample size n from a population of N units, the finite population correction is

20

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- 143. For a random sample from a Poisson population $P(\lambda)$, the maximum likelihood estimate of λ_{12}
 - (A Median
 -) (B) Mode
 - (C) Geometric n.ean

- (D Mean)
- £51 2019 Analysis of variance utilizes 144.
 - (A F-test
 -)
 - χ^2 -test (B)
 - (C) Z-test i-test (D
- 145.

If Var(X+Y) = Var(X) + Var(Y), then the value of correction

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coefficient r_{XY} is

0

) (B) 1 (C) (D 0.5)

(A

If X is Umin rm over (a, b) and if (α, β) is a sub interval of (a, β) 146. ONADN b), then $P(\alpha < X < \beta)$ is equal to

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<u>-α</u> b-a (.A $\frac{\alpha - \beta}{b - a}$ (B) $\frac{\alpha-\beta}{(b-a)^2}$ (C) (D $\frac{\alpha+\beta}{(a-b)^2}$)

- 147. Let *X* be a random variable (r.v.). Then Y = 1/X is also a
 - (A Random variable
 -) (B) Random variable provided P(X=0) = 0
 - (C) Random variable provided P(X=0) = 1
 - (D Not a Random variable
 -)

148. If the values of the 1st and 3rd quartiles are 20 and 30 respectively, then the value of inter quartile range i.

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(A 10) (B) 25 (C) 5 (D 0

)

Let $\{A_n\}$ be a sequence of independent events, P, if 149.

$$(A \qquad \sum P(A_n|) < \infty$$

)
(B)
$$\sum P(A_n|) = \infty$$

(C)
$$\sum P(A_n|) = 1$$

(D)
$$\sum P(A_n|) < 1$$

)

150. If T_n is unbiased and consistent for θ , then

> T_n^2 is unbiased and consistent for θ^2 (A)

 (\mathbf{B})

(C)

)

 T_n^2 is unbiased but not consistent for θ^2 T_n^2 is biased but consistent for θ^2 T_n^2 is biased and not consistent for θ^2 (D

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	STATISTICS - ANSWER KEY TEST CODE: 614								
QN. NO.	KEY	QN. NO.	KEY	QN. NO.	<u>KEY</u>	QN. NO.	KEY	QN. NO.	KEY
1	С	26	D	51	В	76	A	101	С
2	С	27	С	52	В	77	В	102	D
3	С	28	С	53	D	18	C	103	С
4	D	29	В	54	D	75	3	104	D
5	В	30	C	55	С	80	<u>, </u>	105	А
6	С	31	D	56	B	81	С	106	А
7	А	32	В	57	Ĉ	82	Α	107	Α
8	А	33	С	58	A	83	D	108	D
9	D	34	С	59	A	84	С	109	С
10	В	35	D	60	B	85	А	110	Α
11	В	36	В	61	В	86	В	111	В
12	С	37	А	-52	Ê	87	D	112	D
13	С	38	A	63	3	88	D	113	D
14	В	39	A.	64	D	89	A	114	А
15	В	40	B	65	С	90	3	115	С
16	С	41	C	50	А	91	В	116	D
17	В	42	A	67	В	92	A	117	С
18	D	43	C	68	А	93	С	118	D
19	В	44	Ъ	69	В	94	А	119	А
20	С	45	Ь	70	С	95	D	120	А
21	С	46	3	71	A	96	С	121	С
22	D	47	В	72	A	97	С	122	D
23	А	48	В	73	В	98	А	123	А
24	С	49	С	74	A	99	D	124	С
25	D	50	А	75	A	100	D	125	С
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QN. NO.	KEY
126	C
127	C D A
128	А
129	В
130	В
131	С
132	С
133	С
134	B C C C C D
135	D
136	В
137	B C
138	C A
139	
140	В
141	В
142	С
143	D
144	C D A
145	A A B
146	А
147	В
148	С
149	А
150	С

