Subject Code : 614 Section Code : -Select- Difficulty: 1

Subject Code	Q Id	Questions	Answer Key
614	1801	Given that an infinite series of real numbers is convergent, which of the following is true? (A) As n tends to infinity the n-th term of the series tends to 0 (B) As n tends to infinity the n-th term of the series does not tend to 0 (C) As n tends to infinity the n-th term of the series tends to 1 (D) As n tends to infinity, the n-th term need not have any limit	(A)
614	1802	The infinite sum of � + � + 1/8+ 1/16+… is equal to what? (A) 1 (B) 2 (C) 3 (D) 4	(A)
614	1803	For the infinite sum of 1/n from n = 1 to infinity, which of the following is true? (A) The infinite sum converges to 1 (B) The infinite sum converges to 2 (C) The infinite sum converges to 4 (D) The infinite sum diverges to infinity	(D)
614	1804	The infinite sum of the reciprocal of factorial n from n = 1 to infinity is equal to which one of the following? (A) 1 (B) 2 (C) e (D) Infinity	(C)
614	1805	Which of the following is true for a real valued function f of a real variable? (A) If f is continuous then f must be differentiable (B) If f is differentiable then f must be continuous (C) If f is differentiable then it need not be continuous (D) If f is not differentiable then it cannot be continuous	(B)
614	1806	If $f(x) = 2x$, $0 < x < 1$, and $g(x) = 3 - x$, $0 < x < 3$, what is $f(g(5/2)) + g(f(1/2))$? (A) 2 (B) 0 (C) 1 (D) 3	(D)
614	1807	If $f(x) = -1$ whenever x is an irrational number and $f(x) = 1$ whenever x is a rational number, where x is any number in (0,1), which of the following is true? (A) f is a continuous function in (0,1) (B) f is a discontinuous function in (0,1) (C) f is a differentiable function in (0,1)	(B)

		(D) f is a continuous and differentiable function in (0,1)	
614	1808	If $f(x) = \exp(-x)$, $x > 0$, where exp(.) is the exponential function, what is integral of $f(x)\,dx$ over 0 to infinity? (A) 0 (B) 0.5 (C) 1 (D) Infinity	(C)
614	1809	If $f(x) = \lvert x \rvert$, $-1 < x < 1$, what is the minimum value of $1/f(x)$? (A) 0 (B) –1 (C) 1 (D) None of the above	(C)
614	1810	What is limit as n tends to infinity of the n-th power of $(1 + 1/n)$? (A) 1 (B) Limit does not exist (C) Infinity (D) e	(D)
614	1811	What is limit as n tends to infinity of (1 + � + 1/ 3 + … + 1/ n)? (A) 1 (B) 3/2 (C) Infinity (D) 0	(C)
614	1812	Which of the following is true with reference to the series (1 + 1/2^2 + 1/3^2 + 1/4^2 + …), where ^ denotes `power of'? (A) The series converges (B) The series diverges (C) The series neither converges nor diverges (D) The series diverges to infinity	(A)
614	1813	If A is a matrix with 4 rows and 5 columns, which of the following statements is true with reference to the rank of A? (A) Rank of A is the number of nonzero rows of A (B) Rank of A is the number of nonzero columns of A (C) Rank of A is the minimum of the number of nonzero rows of A and the number of nonzero columns of A (D) Rank of A is the number of linearly independent rows of A	(D)
614	1814	If A is a real, square matrix, which of the following must be true for the sum of A and its transpose? (A) The sum of A and its transpose is not defined (B) The sum of A and its transpose is symmetric C (C) The sum of A and its transpose need not be symmetric (D) The sum of A and its transpose is not symmetric	(B)

614	1815	If A is a non-singular matrix, which of the following is not true? (A) Determinant of A is not equal to zero (B) Inverse of A exists (C) Determinant of A is equal to zero (D) A has full row rank	(C)
614	1816	When is a square matrix A said to idempotent? (A) When A^2 = A, where ^ denotes `power of' (B) When transpose of A = A (C) When 2A = A (D) When determinant of A is equal to zero	(A)
614	1817	With reference to Rank of matrix AB for which AB is defined, which of the following is not correct? (A) Rank of AB is at the most Rank of A (B) Rank of AB is at the most Rank of B (C) Rank of AB is at the most minimum of Rank of A and Rank of B (D) Rank of AB is at least minimum of Rank of A and Rank of B	(D)
614	1818	For any matrix A, which of the following need not be true? (A) The product of A and its transpose is symmetric (B) The product of transpose of A with A is symmetric (C) The product of transpose of A with A is idempotent (D) Both the product of transpose of A with A and the product of A with its transpose are symmetric	(C)
614	1819	Which of the following defines rank of a matrix? (A) The number of non-zero rows (B) The number of non-zero columns (C) The number of linearly dependent rows (D) The number of linearly independent rows	(D)
614	1820	The roots of the equations $\begin{vmatrix} 0 & x & 16 \\ x & 5 & 7 \\ 0 & 9 & x \end{vmatrix} = 0$ are (A) (0, 9, 16) (B) (0, 12, 15) (C) (0, –12, 12) (D) (0, 15, 16)	(C)
614	1821	Which of the following is not true for any matrix A? (A) Row rank is the number of linearly independent rows of A (B) Row rank of A is always equal to column rank of A (C) Column rank of A is the number of linearly independent columns of A (D) Row rank of A is less than column rank of A	(D)

614	1822	If the linear system of equations Ax = b is consistent, where A is a matrix and x and b are vectors, which of the following is not true? (A) Rank of the matrix A augmented with the vector b is the same as rank of A (B) Rank of the matrix A augmented with the vector b is 1 + rank of A (C) The vector b belongs to the column space of A (D) The system has a solution	(B)
614	1823	With reference to the 2�2 matrix A with the first row as (0 1) and the second row as (1 0), which of the following is not true? (A) A has rank 2 (B) Determinant of A is non-zero (C) Inverse of A is A (D) A is idempotent	(D)
614	1824	For which of the following matrices, the rank is equal to the sum of the leading diagonal entries? (A) Square matrix (B) Symmetric matrix (C) Idempotent matrix (D) Square, symmetric matrix	(C)
614	1825	Given two vectors a and b of the same dimension, which of the following is not true? (A) Vectors a and b orthogonal implies that a and b are linearly independent (B) Vectors a and b orthogonal does not, in general, imply that a and b are linearly independent (C) Vectors a and b orthogonal implies that dot product between a and b is zero (D) Vectors a and b orthogonal, means that the sum of the component-wise products of a and b is equal to zero	(B)
614	1826	Given a set of vectors of the same dimension, which of the following is true? (A) If the set is linearly independent, then every subset is linearly independent (B) If the set is linearly independent, then every superset is linearly independent (C) If the set is linearly dependent, then every subset is linearly dependent (D) If the set is linearly dependent, then every superset is llinearly independent	(A)
614	1827	Given that P(A)=1/2, P(B) = �, P(A|B) = 1/3, what is the value of P(A U B)? (A) 2/5 (B) � (C) 2/3 (D) 5/12	(C)
614	1828	Given that A and B are independent events, which of the following is true? (A) P(A) =P(A|B) (B) P(A) (C) P(A)>P(A|B) (D) P(A)=P(A|B)P(B)	(A)
614	1829	If A and B are independent events, which of the following gives P(A U B)? (A) 1 – P(A^c)P(B^c), where A^c is complement of A	(A)

		(B) P(A) + P(B) (C) 2 – P(A^c) – P(B^c) (D) P(A) + P(B) + P(AB)	
614	1830	Which of the following is not a consequence of the axioms of probability? (A) P(A) = 1 – P(A^c), where A^c is complement of A. (B) P(A U B) = P(A) + P(B) – P(AB), where AB means A intersection B. (C) P(AB) = P(A)P(B). (D) P(AB) = 1 – P(A^c U B^c).	(C)
614	1831	If event A implies event B, which of the following is true? (A) P(A^c) is less than or equal to P(B^c), where A^c is the complement of A. (B) P(A^c) is more than or equal to P(B^c). (C) P(AB) = P(B), where AB denotes intersection of A and B. (D) P(AB) is greater than or equal to P(B).	(B)
614	1832	If A and B are independent events, which of the following is not true? (A) P(A U B) = P(A)P(B^c) + P(B), where B^c denotes complement of B (B) P(AB) = 1 – P(A^c) – P(B^c) + P(A^c)P(B^c), where AB denotes intersection of A and B (C) P(A U B) = P(A) + P(B) (D) P(AB) = 1 – P(A^c U B^c)	(C)
614	1833	Which of the following statements is not true with reference to Probability? (A) Probability is a set function (B) Probability is a [0,1]-valued function (C) Probability is an additive function (D) Probability is a linear function	(D)
614	1834	If A and B are independent events with P(B) > 0, which of the following is true with reference to the conditional probability of A given B? (A) It is equal to P(A) (B) It is equal to P(B) (C) It is equal to P(AB) (D) It is equal to P(A).P(B)	(A)
614	1835	If two fair coins are thrown simultaneously once, what is the probability of getting at least one heads? (A) � (B) � (C) � (D) 1/3	(C)
614	1836	If a fair coin is thrown repeatedly till Heads appears, what is the probability that Heads appears for the first time at the 12th throw? (A) 1/4096 (B) 1/256	(A)

		(C) 1/64 (D) 1/12	
614	1837	If two six-sided dice whose faces are numbered with numbers from 1 to 6, are thrown simultaneously, what is the probability that the sum of numbers on the two dice facing up is even? (A) 1/6 (B) 1/3 (C) � (D) 1/12	(C)
614	1838	If X is a random variable with P(X = –1) = 1/3 = 1–P(X=1), then which of the following is true? (A) E(X) = 1/3, V(X) = 1/9 (B) E(X) = 2/3, V(X) = 1 (C) E(X) = 0, V(X) = 2/9 (D) E(X) = 1/3, V(X) = 8/9	(D)
614	1839	If X is a random variable with E(X) = –1 and V(X) = 1, then what is E(X^2), where ^ denotes `power of'? (A) 0 (B) 2 (C) 1 (D) 4	(B)
614	1840	If X is a random variable with P(X = k) = 1/2^k, k = 1, 2, …., what is the variance of X? (A) 2 (B) 4 (C) 6 (D) 8	(A)
614	1841	If X_0, X_1, X_2, … are standard Bernoulli random variables with probability of success �, what is the distribution of X_0 + X_1 + X_2 + … + X_9? (A) Binomial with parameters 9 and � (B) Binomial with parameters 10 and � (C) Binomial with parameters 9 and 1 (D) Binomial with parameters 10 and 1	(B)
614	1842	If X and Y are independent Poisson random variables with mean 1, which of the following is not correct? (A) X+ Y is a Poisson random variable with mean 2 (B) X+Y is a Poisson random variable with variance 2 (C) X+Y is a Poisson random variable with variance 4 (D) X+ Y is a Poisson random variable with coefficient of variation equal to reciprocal of square root of 2	(C)
614	1843	If X and Y are independent Poisson random variables with variance 1/2, what is the coefficient of variation of X+Y? (A) 1 (B) �	(A)

		(C) Reciprocal of square root of 2 (D) 2	
614	1844	If X is a standard normal random variable, what is the distribution of the square of X? (A) Normal (B) Chi-square (C) F (D) t	(B)
614	1845	If X is a random variable with P(X = k) = exp(–1) / k!, k = 0, 1, 2, …., where ! denotes factorial, what is the mean of X + 2? (A) 1 (B) 2 (C) 3 (D) 4	(C)
614	1846	If X is the uniform random variable over the interval (0,1), what is the coefficient of variation of X? (A) Reciprocal of square root of 2 (B) Reciprocal of square root of 3 (C) � (D) �	(B)
614	1847	If X has standard exponential distribution, what is the second moment E(X^2) of X? (A) 1 (B) 2 (C) 3 (D) 4	(B)
614	1848	If X has uniform distribution over (0,1), what is the distribution of – ln (X), where ln is the natural logarithm to base e? (A) Uniform over (0,1). (B) Standard exponential (C) Standard normal. (D) Standard log-normal.	(B)
614	1849	If X_1, X_2, …, X_n are independent random variables, all having standard normal distribution, what is the distribution of their mean (X_1 + ...+ X_n) / n? (A) Standard normal (B) Normal with mean 0 and variance 1 (C) Normal with mean 0 and variance 1/ *n* (D) Normal with mean 0 and variance *n*	(C)
614	1850	If X and Y are independent random variables having the same moment generating function M(.), what is the moment generating function of X+Y? (A) 2M(.) (B) M^2(.) (C) M(.)	(B)

		(D) M(.) / 2	
614	1851	If P(.) denotes the probability generating function of a discrete random variable X taking values 0, 1, 2, …, what is P(0)? (A) P(X = 0) (B) 1 (C) 0 (D) P(X = 1)	(A)
614	1852	In a completely randomized design, the number of sources with respect to which the yield of interest varies is what? (A) 1 (B) 2 (C) 3 (D) 0	(A)
614	1853	Which of the following is not a fundamental principle of design of statistical experiments? (A) Local control (B) Replication (C) Randomization (D) Global control	(D)
614	1854	If there are 5 treatments in a completely randomized design with 10 observations, the degrees of freedom for the error is what? (A) 5 (B) 10 (C) 6 (D) 15	(A)
614	1855	In a randomized block design with 4 treatments and 6 blocks, the degrees of freedom for the error is what? (A) 9 (B) 8 (C) 10 (D) 15	(D)
614	1856	Which of these is compared in an analysis of variance technique? (A) Means (B) Medians (C) Covariances (D) Variances	(A)
614	1857	Yates' algorithm in a factorial experiment is used to calculate which of these? (A) Observation totals (B) Treatment totals (C) Block totals (D) Factorial effect totals	(D)

614	1858	Which of the following is true with reference to a randomized block design? (A) The number of sources with respect to which the yield under consideration varies is one (B) The number of sources with respect to which the yield under consideration varies is two (C) The number of sources with respect to which the yield under consideration varies is three (D) The number of sources with respect to which the yield under consideration varies is four	(B)
614	1859	Which of the following is not a treatment contrast, if treatment effects are denoted by a_1, a_2, a_3, a_4, a_5 in a completely randomized design? (A) a_1 – a_2 (B) 2a_1 – a_2 – a_3 (C) a_1 – a_2 + a_3 – a_4 + a_5 (D) 2a_1 – a_2 + a_3 – a_4 – a_5	(C)
614	1860	The value of the correlation coefficient between two variables X and Y is zero implies what? (A) X and Y are always independent (B) X and Y are linearly related (C) X and Y are not linearly related (D) X and Y are always dependent	(C)
614	1861	If r and b denote respectively, the correlation coefficient and the regression coefficient, which of the following is true? (A) Both r and b have the same sign (B) Both r and b have opposite signs (C) r = b (D) r	(A)
614	1862	The regression line of Y given X=x represents what? (A) Conditional mean response given X (B) Conditional expectation of X given Y (C) Conditional variance of response given X (D) Unconditional mean response	(A)
614	1863	In a randomized block design, which of the following is true? (A) The only functions of treatment effects that are estimable are treatment contrasts (B) Every function of treatment effects is estimable (C) No function of treatment effects is estimable (D) Every linear parametric function is estimable	(A)
614	1864	Chebyshev's inequality relates to which of these? (A) Probability and Covariance (B) Probability and Correlation (C) Expectation and Variance (D) Probability and Expectation	(D)
614	1865	If a sequence of random variables converges in probability, then which one of the following statements must be true?	(A)

		(A) The sequence must converge in distribution (B) The sequence must converge almost surely (C) The sequence must converge in expectation (D) The sequence must converge in variance	
614	1866	Which of the following is the distribution of the limit random variable in the central limit theorem? (A) Poisson (B) Chi-square (C) Normal (D) Student's t	(C)
614	1867	If a random variable X has F distribution with degrees of freedom 1 and 2, then what is the distribution of its reciprocal 1/X? (A) F with degrees of freedom 1 and 2 (B) F with degrees of freedom 1 and � (C) F distribution with degrees of freedom 2 and 1 (D) Chi-square distribution with degrees of freedom 3	(C)
614	1868	If X and Y are independent standard exponential random variables, what is the distribution of X+Y? (A) Exponential with mean 2 (B) Gamma with parameter 2 (C) F distribution (D) Standard normal distribution	(B)
614	1869	With reference to mean and standard deviation, which of the following is true? (A) Both are measured in same units (B) Both are measured in different units (C) Both are absolute measures without any unit of measurement (D) Standard deviation is measured in square of unit of measurement of mean	(A)
614	1870	Given that the sum of the upper and lower quartiles is 25 in a frequency distribution, their difference is 13 and the median is 10, what is the coefficient of skewness? (A) 0.03865 (B) 0.3846 (C) 0.4536 (D) 0.4889	(B)
614	1871	Which of the following is a suitable measure of spread for an ordinal data? (A) Mean deviation from mean (B) Mean deviation from median (C) Standard deviation (D) Quartile deviation	(D)
614	1872	In a univariate data, if each of the observations is increased by 10, then what happens to the variance of the new observations? (A) Increases by 10	(C)

		(B) Increases by 100 (C) Same as the variance of the original observations (D) 10 times the variance of the original observations	
614	1873	Which of the following statements is not true for a diagonal matrix A? (A) A can be non-singular (B) A can be singular (C) A is a square matrix (D) A must be non-singular	(D)
614	1874	For which of the following random variables is 6 times variance equal to its mean? (A) Uniform over (0,1) (B) Standard exponential (C) Standard Bernoulli with success probability equal to � (D) Poisson with parameter 1	(A)
614	1875	Which of the following is equal to the coefficient of variation? (A) Mean divided by standard deviation, provided standard deviation is not zero (B) Standard deviation divided by mean, provided mean is not zero (C) Variance divided by mean provided mean is not zero (D) Mean divided by variance provided variance is not zero	(B)
614	1876	Given that X and Y are independent random variables with E(X) =0, standard deviation of X equal to 2, E(Y) = 1 and standard deviation of Y equal to 4, what are the values of Var(X-Y) and Var(X+Y), respectively? (A) 20 and 20 (B) 2 and 4 (C) 16 and 20 (D) 16 and 16	(A)
614	1877	Given that X and Y are independent, normal random variables with means 1 and 2 respectively and common variance 1, what is the distribution of X – Y? (A) Normal with mean 1 and variance 1 (B) Normal with mean –1 and variance 2 (C) Normal with mean –1 and variance 1 (D) Normal with mean 1 and variance 2	(B)
614	1878	Which of the following distribution has coefficient of variation equal to 1? (A) Uniform over (0,1) (B) Standard normal (C) Standard exponential (D) Standard Cauchy	(C)
614	1879	What is the expansion of the word CENSUS? (A) Central Statistical Surveys (B) Central Economic National Surveys	(D)

		(C) Complete Enumeration Sample Surveys (D) Complete Enumeration Surveys	
614	1880	In sampling theory, proportional allocation, Neyman allocation, optimum allocation refer to allocation of which of these? (A) Sample size (B) Sample mean (C) Sampling cost (D) Sample standard error	(A)
614	1881	Which of the following refer to types of systematic sample? (A) Linear and nonlinear (B) Linear and circular (C) Random and linear (D) Random and circular	(B)
614	1882	If U,V,W,X are independent and identically distributed observations from a normal random variable with mean a and variance 1 with a unknown, what is the maximum likelihood estimator of a? (A) U+V+W+X (B) (U+V+W+X)/4 (C) Median of U V, W, X (D) Mode of U, V, W, X	(B)
614	1883	Which of these is the likelihood function of a random sample of size n from a distribution having probability density function (pdf) f with parameter a? (A) Function of the sample for a fixed a (B) Joint pdf of the sample (C) Is the pdf of a for a fixed sample (D) Is the function of a for a given sample	(D)
614	1884	What is the power of the test for testing a null hypothesis H_0? (A) Probability of rejecting H_0 when it is true (B) Probability of accepting H_0 when it is false (C) Probability of rejecting H_0 when it is false (D) Probability of rejecting the alternative when it is true	(C)
614	1885	What does NSSO stand for? (A) National Statistics Survey Organization (B) National Sample Survey Office (C) National Sample Survey Ordinance (D) National Statistics Survey Office	(B)
614	1886	On which curve is population growth plotted? (A) Logistic curve (B) Logarithmic curve (C) Pareto curve	(A)

		(D) Weibull curve	
614	1887	Which are the two broad domains under which a time series is analyzed? (A) Time and space (B) Time and frequency (C) Series and frequency (D) Spectral and frequency	(B)
614	1888	Which of these affect population growth? (A) Births and deaths only (B) Births, deaths and immigration only (C) Births, deaths, immigration and emigration only (D) Immigration and emigration only	(C)
614	1889	Which of these is Fisher's ideal index number associated with? (A) Prices of commodities (B) Quantities of commodities (C) Prices and quality of commodities (D) Prices and quantities of commodities	(D)
614	1890	Which of the following is not a method of estimation? (A) Least squares (B) Maximum likelihood (C) Moment (D) Characteristic	(D)
614	1891	Which of these relate to confidence interval? (A) It is a probability statement (B) It is not a probability statement (C) It is a statement about conditional probability (D) It is a statement about conditional expectation	(A)
614	1892	Given that the coefficient of variation is 1, which of the following is true? (A) Mean and variance are same (B) Mean and standard deviation are same (C) Square of mean is equal to variance (D) Square of variance is equal to mean	(B)
614	1893	If X and Y are independent standard Bernoulli random variables with the same parameter p, what is the distribution of X+Y? (A) Binomial with parameters 2 and p (B) Binomial with parameters n and p (C) Binomial with parameters 2 and 2p (D) Binomial with parameters 2 and p/2	(A)

614	1894	What is the infinite sum 1–1+1–1+1–1+.... equal to? (A) The infinite sum does not exist (B) It is equal to 0 (C) It is equal to 1 (D) It is equal to –1	(A)
614	1895	What is the value of the integral of the function x raised to 3 over the limits –1 to 1 ? (A) –1/2 (B) � (C) 0 (D) 2	(C)
614	1896	What is integral of the function 1/log x over the limits 1 to infinity? (A) Converges to 0 (B) Converges to the number e (C) Diverges to infinity (D) Diverges to – infinity	(C)
614	1897	If determinant of a matrix A is equal to 0, which of the following is not true? (A) A is a singular matrix (B) A is a non-singular matrix (C) Inverse of A does not exist (D) A may be null matrix.	(B)
614	1898	If A and B are non-singular square matrices of same order, then which of the following is true for AB? (A) AB is non-singular (B) AB is singular (C) AB is square and singular (D) AB is not defined	(A)
614	1899	Which of the following is true in a 2^2-factorial experiment? (A) There are four factors (B) There are four levels (C) There are two factors each considered at two levels (D) There are four factors each considered at four levels	(C)
614	1900	Given a vector space V, which of the following need not be true? (A) V is closed under vector addition (B) V is closed under scalar multiplication (C) V is closed under vector multiplication (D) V is closed under linear combinations of vectors	(C)
614	1901	What are the characteristic roots of the identity matrix of order 2? (A) 0 and 1 (B) 0 and 0	(C)

		(C) 1 and 1 (D) –1 and 1	
614	1902	If A and B are any two symmetric matrices of the same order, which of the following need not be true? (A) A+B is symmetric (B) A – B is symmetric (C) AB = BA (D) A^T + B^T is symmetric, where A^T denotes transpose of A	(C)
614	1903	Which of the following is measured without any unit of measurement? (A) Standard deviation (B) Mean deviation about mean (C) Mean deviation about median (D) Coefficient of variation	(D)
614	1904	If X has binomial distribution with paramters 2 and �, which of the following is true? (A) Mean of X is less than variance of X (B) Mean of X is equal to variance of X (C) Mean of X is strictly greater than variance of X (D) Variance of X is strictly greater than mean of X	(C)
614	1905	If X has Poisson distribution with mean 1, then what is the expected value of X^2? (A) 0 (B) 1 (C) 2 (D) square root of 2	(C)
614	1906	A most powerful test is considered when (A) both null and alternative hypotheses are composite (B) null hypothesis is simple and alternative is composite (C) null hypothesis is composite and alternative is simple (D) both null and alternative are simple	(D)
614	1907	The power under alternative hypothesis of a most powerful test of size 0.05 cannot be (A) 0.06 (B) 0.03 (C) 0.08 (D) 0.1	(B)
614	1908	For testing $H:\theta = 0.5$ against $K:\theta = 0.75$ based on a single observation drawn from $B(3,\theta)$ the test “Reject H if $x > 2$” is to be used. The probability of type-I error is (A) $\frac{1}{27}$	(B)

		(B) $\frac{1}{8}$ (C) $\frac{27}{81}$ (D) $\frac{1}{81}$	
614	1909	A non parametric test based on empirical distribution functions is (A) Kolmogrov-Smirnov test (B) Mann-Whitney U test (C) Wilcoxon test (D) Kruskal Wallis test	(A)
614	1910	Which of the following theorem finds application in non parametric tests? (A) Neyman Factorization theorem (B) Glivenko-Cantelli theorem (C) Neyman Pearson lemma (D) Cochran's theorem	(B)
614	1911	Which of the following non parametric tests can be used for testing the goodness of fit? (A) Sign Test (B) Run Test (C) Median Test (D) Kolmogrov-Smirnov test	(D)
614	1912	In a sample of size 3 drawn from $N(\theta,1)$, which of the following estimators is not unbiased for θ? (A) $X_1+X_2+X_3$ (B) $\frac{X_1+X_2+X_3}{3}$ (C) $\frac{2X_1+X_2+X_3}{4}$ (D) $\frac{2X_1-X_2+5X_3}{6}$	(A)
614	1913	The value of α for which $\alpha X_1+(1-\alpha)X_2$ has minimum variance when X_1 and X_2 are independent Poisson variates with mean λ is (A)	(D)

		$\frac{1}{3}$ (B) 1 (C) $\frac{2}{3}$ (D) $\frac{1}{2}$	
614	1914	In sampling from a population with probability density function $f(x\mid\theta)=e^{-(x-\theta)} x>\theta,\theta>0$ the maximum likelihood estimator of θ is (A) the first order statistic (B) the sample mean (C) the sample median (D) the largest order statistic	(A)
614	1915	Cramer Rao inequality gives a bound for (A) the bias of an estimator (B) the variance of an unbiased estimator (C) the variance of a sufficient statistic (D) the variance of any statistic	(B)
614	1916	Choose the correct statement (A) Consistent estimator is unique (B) Unbiased estimator is unique (C) Consistency is a large sample property (D) unbiasedness is a large sample property	(C)
614	1917	In simple random sampling with replacement, the number of times the ith population unit appears in the sample is (A) Binomial distribution (B) Hypergeometric distribution (C) Geometric distribution (D) Negative binomial distribution	(A)
614	1918	(A) (B) (C) (D)	(D)
614	1919	Under what condition sample mean is unbiased for the population mean in stratified random sampling (A) Always (B) Never	(D)

		(C) If stratum sizes are equal (D) when stratum sampling fractions coincide with population sampling fraction	
614	1920	Given that the systematic sample corresponding to start 4 contains units with labels 4,9,14,19,24. The population size is (A) 20 (B) 25 (C) 15 (D) 30	(B)
614	1921	In simple random sampling without replacement, $Cov(y_i, y_j), i \neq j$ where y_i and y_j denote the values of units selected in i^{th} and j^{th} drawn is (A) 0 (B) σ^2 (C) $\frac{\sigma^2}{N-1}$ (D) $-\frac{\sigma^2}{N-1}$	(D)
614	1922	In systematic sampling, when N=16 and n=4 the probability of including 7^{th} and 9^{th} units in the sample is (A) 0 (B) 1 (C) $\frac{1}{16}$ (D) $\frac{1}{4}$	(A)
614	1923	If the rank of the matrix $A = \begin{bmatrix} a & 2 \\ 1 & b \end{bmatrix}$ is 1 then (A) $ab+2=0$ (B) $ab-2=0$ (C) $2a+b=0$ (D) $a+2b=0$	(B)
614	1924		(A)

		Value of $\begin{vmatrix} 1 & 2 & 4 \\ 1 & 3 & 9 \\ 1 & 4 & 16 \end{vmatrix}$ is (A) 2 (B) –2 (C) 0 (D) 48	
614	1925	If the system of equations $x+2y+z=0; ax+y+z=0; x+y+az=0$ has a nontrivial solution then (A) $a \neq 1$ (B) $a=1$ or $a=0$ (C) $a \neq 0$ (D) $a=2$	(B)
614	1926	If A_3 is the third row of an orthogonal matrix A then (A) $A_3A_3^T=1$ (B) $A_3A_3^T=0$ (C) $A_3A_3^T=\pm1$ (D) $A_3A_3^T=-1$	(A)
614	1927	If the eigen values of a 3 x 3 singular matrix are 3,4 and x then the value of x is (A) 7 (B) –7 (C) 0 (D) 12	(C)
614	1928	For what value(s) of x the following vectors are linearly independent? $(x,0,1),(0,2,1),(2,0,1)$ (A) x=2 only (B) x=4 only (C) for any x different from 2	(C)

		(D) for any *x* different from 4	
614	1929	Choose the correct statement (A) Distribution functions are always continuous (B) In a distribution function jumps indicate positive mass at those points (C) In a distribution function jumps indicate zero mass at those points (D) Distribution functions can never be continuous	(B)
614	1930	A and B are two independent events such that $P(\bar{A}) = 0.7,\ P(\bar{B}) = k\ \ and\ \ P(A \cup B) = 0.8$, then k is (A) 5/7 (B) 2/7 (C) 1 (D) 0	(B)
614	1931	Choose the correct statement: (A) P(AB) cannot exceed P(A) (B) A density function can never take value exceeding zero (C) A density function can take negative values (D) disjointness of events is same as independence	(A)
614	1932	X and Y are independent standard normal variates then $V(X^2+Y^2)$ is (A) 4 (B) 2 (C) 8 (D) 16	(A)
614	1933	Given Cov(X,Y)=7,V(X)=V(Y) then Cov (2X+Y, X−2Y) is (A) 7 (B) 21 (C) –21 (D) –7	(C)
614	1934	In a randomized block design with 6 blocks and 7 treatments the degrees of freedom for error is given by (A) 30 (B) 40 (C) 42 (D) 21	(A)
614	1935		(A)

		Least squares estimates of treatments in the linear model associated with completely randomised design are [where $\bar{y}_{io} = \sum_{j}^{r_i} \frac{y_{ij}}{r_i}, \bar{y}_{oi} = \frac{1}{V} \sum_{j}^{v} y_{ij}, \bar{y}_{oo} = \frac{1}{n} \sum_{i=1}^{v} \sum_{j=1}^{r_i} y_{ij}$] (A) $\hat{t}_i = \bar{y}_{io} - \bar{y}_{oo}$ (B) $\hat{t}_i = \bar{y}_{oi} - \bar{y}_{oo}$ (C) $\hat{t}_i = \bar{y}_{io}$ (D) $\hat{t}_i = \bar{y}_{io} - \bar{y}_{oi}$	
614	1936	For which of the following choices binomial distribution has positive skewness? (A) $p = 0.5$ (B) $p = 0.3$ (C) $p = 0.6$ (D) $p = 0.75$	(B)
614	1937	Choose the correct statement. (A) Poisson distribution is a skewed distribution. (B) Difference of two independent Poisson variates has Poisson distribution (C) Poisson distribution is unimodal distribution. (D) Conditional distribution of X given $X+Y$ when X and Y are independent Poisson variates has Poisson distribution.	(A)
614	1938	Choose the correct statement. (A) Sum of Independently and Identically distributed geometric random variables has geometric distribution. (B) Sum of Independently and Identically distributed geometric random variables has negative binomial distribution (C) Sum of Independently and Identically distributed geometric random variables has binomial distribution (D) Sum of Independently and Identically distributed geometric random variables has hyper geometric distribution	(B)
614	1939	The distribution arising from sampling without replacement is (A) Binomial distribution (B) Hyper geometric distribution (C) Geometric distribution (D) Negative binomial distribution	(B)
614	1940	If the variance of a chisquare statistic is 16 then its mean is (A) 8	(A)

		(B) 32 (C) 4 (D) 16	
614	1941	If the maximum ordinate of a normal distribution is one then the standard deviation is (A) $\frac{1}{2\pi}$ (B) $\sqrt{2\pi}$ (C) $\frac{1}{\sqrt{2\pi}}$ (D) 2π	(C)
614	1942	If X has uniform distribution defined over [0,1] then the distribution of $-2\log X$ has (A) standard normal distribution (B) Cauchy distribution with location zero (C) chi square distribution (D) Uniform distribution over [0,1]	(C)
614	1943	Given the multinomial distribution with probability mass function $p(x_1, x_2, x_3, x_4) = \frac{14!}{x_1!x_2!x_3!x_4!}(0.2)^{x_1}(0.10)^{x_2}(0.3)^{x_3}(0.4)^{x_4}$, $x_i = 0,1,2,..14; \sum_{i=1}^{4} x_i = 14$ The covariance between X_2 and X_4 is (A) 0.56 (B) –0.56 (C) 0.24 (D) –0.24	(B)
614	1944	The infinite series $\sum_{n=1}^{\infty} \frac{1}{n^p}$ is (A) Always convergent (B) Always divergent (C) Convergent if p=1 (D) Convergent if p>1	(D)
614	1945	$\int \log x dx$ is (A)	(C)

		$\frac{1}{x}$ (B) $x\log x$ (C) $x\log x - x$ (D) $x\log x + x$	
614	1946	The value of $\int_o^\infty x^5 e^{-x} dx$ (A) 5 (B) 120 (C) 720 (D) 24	(B)
614	1947	The minimum value of $f(x) = x\log x$ is (A) e (B) $\frac{1}{e}$ (C) $\frac{-1}{e}$ (D) $-e$	(B)
614	1948	Karl Pearson formula for coefficient of correlation can be used for (A) Measuring linear relationship between two variables (B) Measuring nonlinear relationship between two variables (C) Measuring correlation between any two ordinal variables (D) Measuring the relationship between two binary variables	(A)
614	1949	Blocking in randomised block design is meant for ensuring (A) Randomization (B) Replication (C) Local Control (D) all of them	(C)
614	1950	Analysis of variance is meant for testing (A) the equality of several variances (B) the equality of several means (C) given normal populations are identical (D) the equality of several proportions	(B)