DU MPhil PhD in Statistics

Topic:- DU_J18_MPHIL_STATS_Topic01

1) Which of the following is a point of PG(3, 2)?

[Question ID = 17310]

1. (0, 2, 0) [Option ID = 39232]
2. (0, 1, 1, 1) [Option ID = 39233]
3. (0, 0, 0, 0) [Option ID = 39234]
4. (1, 0, 1) [Option ID = 39231]

Correct Answer :-

- (0, 1, 1, 1) [Option ID = 39233]

2) Suppose a cricket ball manufacturing company formed lots of 500 balls. To check the quality of the lots, the buyer draws 20 balls from each lot and accepts the lot if the sample contains at the most 1 defective ball. If the quality of submitted lot is 0.03, the AOQ for this plan under corrective sampling is

[Question ID = 17248]

1. 0.015 [Option ID = 38983]
2. 0.035 [Option ID = 38985]
3. 0.025 [Option ID = 38984]
4. 0.045 [Option ID = 38986]

Correct Answer :-

- 0.025 [Option ID = 38984]

3) In time series analysis, the Box–Jenkins method is based on fitting which of the following models:

[Question ID = 17242]

1. autoregressive moving average (ARMA) [Option ID = 38959]
2. autoregressive integrated moving average (ARIMA) [Option ID = 38960]
3. none of these [Option ID = 38962]
4. both autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) [Option ID = 38961]

Correct Answer :-

- both autoregressive moving average (ARMA) and autoregressive integrated moving average (ARIMA) [Option ID = 38961]

4) The number of points in a 3-dimensional subspace of PG (4, 2) is: [Question ID = 17227]

1. 15 [Option ID = 38902]
2. 31 [Option ID = 38899]
3. 13 [Option ID = 38901]
4. 21 [Option ID = 38900]

Correct Answer :-

- 15 [Option ID = 38902]

5) If $\{X_n, n \geq 1\}$ is a sequence of independent and identically distributed standard Cauchy variates and $Z = \frac{X_1 + X_2 + ... + X_n}{n}$, then the value of $E\left(\frac{Z^2}{1+Z^2}\right)$ is:

[Question ID = 17309]

1. 1 [Option ID = 39227]
2. 0 [Option ID = 39230]
3. 0.25 [Option ID = 39229]
4. 0.5 [Option ID = 39228]

Correct Answer :-

- 0.5 [Option ID = 39228]

6) Consider the problem of testing H_0: X~ Normal with mean 0 and variance $\frac{1}{2}$ against H_1: X ~ Cauchy (0, 1). Then for testing H_0 against H_1, the most powerful size α test

[Question ID = 17257]

1. rejects H_0 if and only if $|x| > c_2$ where c_2 is such that the test is of size α [Option ID = 39020]
2. rejects H_0 if and only if $|x| < c_4$ or $|x| > c_5$, $c_4 < c_5$ where c_4 and c_5 are such that the test is of size α [Option ID = 39022]
3. rejects H_0 if and only if $|x| < c_3$ where c_3 is such that the test is of size α [Option ID = 39021]
4. does not exist [Option ID = 39019]

Correct Answer :-

- rejects H_0 if and only if $|x| > c_2$ where c_2 is such that the test is of size α [Option ID = 39020]

7) If X is a p- component random vector with $V(X) = \Sigma$ and if A is any constant matrix of order $p \times p$, then $V(AX)$ is equal to

[Question ID = 17233]

1. $A'\Sigma A$ [Option ID = 38924]
2. Σ [Option ID = 38926]
3. $A\Sigma$ [Option ID = 38925]
4. $A\Sigma A'$ [Option ID = 38923]

Correct Answer :-

- $A\Sigma A'$ [Option ID = 38923]

8) Let $X_1, X_2, \ldots, X_n$ be a random sample from a population with pmf

$$P_\theta(X = x) = \theta^x(1-\theta)^{1-x},\ x = 0 \text{ or } 1 \text{ and } 0 \le \theta \le \frac{1}{2}.$$

Then the MLE of θ is:

[Question ID = 17253]

1. $\sum_{i=1}^{n} X_i$ [Option ID = 39003]
2. $\bar{X}$ [Option ID = 39004]
3. $\text{Min}\left[\bar{X}, \frac{1}{2}\right]$ [Option ID = 39005]
4. 1 [Option ID = 39006]

Correct Answer :-

- $\text{Min}\left[\bar{X}, \frac{1}{2}\right]$ [Option ID = 39005]

9) Consider a renewal process $\{N_t ; t \ge 0\}$ for which the inter arrival time follows $U(0,1)$ distribution. The renewal function for $0 \le t \le 1$ is given by

[Question ID = 17223]

1. e^{t-1} [Option ID = 38885]
2. e^{2t-1} [Option ID = 38886]

3. e^{-2t-1} [Option ID = 38883]
4. e^{-2t} [Option ID = 38884]

Correct Answer :-

- e^{t-1} [Option ID = 38885]

10) For a two-way random effects model with m observations per cell, factor A has p levels and factor B has q levels. Then the expression for $\hat{\sigma}_A^2$ is:

[Question ID = 17229]

1. $\frac{MSA-MSB}{pq}$ [Option ID = 38909]
2. None of these [Option ID = 38910]
3. $\frac{MSB-MS(AB)}{pm}$ [Option ID = 38908]
4. $\frac{MSA-MS(AB)}{qm}$ [Option ID = 38907]

Correct Answer :-

- $\frac{MSA-MS(AB)}{qm}$ [Option ID = 38907]

11) Let $X_1 \sim N(\mu, \sigma^2)$ and $X_2, X_3, ..., X_n$ be a sample of size (n-1) drawn from $N(0,\sigma^2)$. Further, let X_1 is independent of $X_2, X_3, ..., X_n$. Then $\chi^2 = \frac{X_1^2+X_2^2+...+X_n^2}{\sigma^2}$ has a chi-square distribution with

1. (n-1) degrees of freedom
2. n degrees of freedom
3. non centrality parameter $\frac{\mu^2}{\sigma^2}$
4. non centrality parameter $\frac{n\mu^2}{\sigma^2}$

Which of the above is/are correct?

[Question ID = 17216]

1. 1 only [Option ID = 38855]
2. 2 only [Option ID = 38856]
3. Both 2 and 3 [Option ID = 38857]
4. Both 1 and 4 [Option ID = 38858]

Correct Answer :-

- Both 2 and 3 [Option ID = 38857]

12) Let $\{X_n, n \geq 1\}$ be a sequence of random variables, with

$$\text{Cov}(X_i, X_j) = \begin{cases} 1, & i = j \\ \frac{1}{2}, & |i-j| = 1,2,3 \\ 0, & \text{otherwise.} \end{cases}$$

Then the value of $\frac{\text{Var.}(X_1 + X_2 + ... + X_n)}{n^2}$ is:

[Question ID = 17208]

1. $4-6n$ [Option ID = 38823]
2. $4n-6$ [Option ID = 38825]
3. $4n+6$ [Option ID = 38824]
4. $\frac{4}{n}-\frac{6}{n^2}$ [Option ID = 38826]

Correct Answer :-

- $\frac{4}{n}-\frac{6}{n^2}$ [Option ID = 38826]

13) If $A = \begin{pmatrix} A_{\underset{k\times k}{11}} & A_{12} \\ A_{21} & A_{22} \end{pmatrix} \sim W_p(n, \Sigma)$, where $\Sigma = \begin{pmatrix} \Sigma_{\underset{k\times k}{11}} & \Sigma_{12} \\ \Sigma_{21} & \Sigma_{22} \end{pmatrix}$, then, with usual notations, the distribution of $A_{22.1} = A_{22} - A_{21}A_{11}^{-1}A_{12}$ is

[Question ID = 17234]

1. $W_k(n-p+k, \Sigma_{22.1})$ [Option ID = 38929]
2. $W_k(n-k, \Sigma_{22.1})$ [Option ID = 38930]
3. $W_{p-k}(n-k, \Sigma_{22.1})$ [Option ID = 38928]
4. $W_{p-k}(n-p+k, \Sigma_{22.1})$ [Option ID = 38927]

Correct Answer :-

- $W_{p-k}(n-k, \Sigma_{22.1})$ [Option ID = 38928]

14) A sample of size n $(n \geq 2)$ is drawn from a finite population of N units by probabilities proportional to size sampling with selection probability p_i; $(1 \leq i \leq N, 0 < p_i < 1, \sum_{i=1}^{N} p_i = 1)$. Let $T = \frac{1}{n}\sum_{i=1}^{n}\frac{y_i}{p_i}$ where y_i is the value of a study variable for the i^{th} unit and the sum extends over the units included in the sample. Which of the following statements is true?

[Question ID = 17244]

1. the variance of T reduces to 0 if p_i = 1/N ; for all i; $1 \leq i \leq N$. [Option ID = 38969]
2. Variance of T remains same. [Option ID = 38970]
3. nT is an unbiased estimator of the population total $\sum_{i=1}^{N} y_i$ [Option ID = 38968]
4. T is an unbiased estimator of the population total $\sum_{i=1}^{N} y_i$ [Option ID = 38967]

Correct Answer :-

- T is an unbiased estimator of the population total $\sum_{i=1}^{N} y_i$ [Option ID = 38967]

15) If $X \sim N_p(\mu, \Sigma)$, then the distribution of $X'\Sigma^{-1}X$ is

[Question ID = 17232]

1. Central Chi-square [Option ID = 38921]
2. Multivariate normal [Option ID = 38920]
3. Univariate normal [Option ID = 38919]
4. Non-central Chi-square [Option ID = 38922]

Correct Answer :-

- Non-central Chi-square [Option ID = 38922]

16)

Let $X_\alpha(\alpha = 1,2,\ldots,N)$ be N independent observations from $N_p(\mu,\Sigma)$, $\bar{X} = \frac{1}{N}\sum_{\alpha=1}^{N} X_\alpha$, and let $\hat{\Sigma}$ be the maximum likelihood estimator for Σ. Then which one of the following statements is true?

[Question ID = 17236]

1. $\bar{X}$ and $\frac{1}{N}\sum_{\alpha=1}^{N}(X_\alpha - \bar{X})(X_\alpha - \bar{X})'$ are independently distributed. [Option ID = 38936]
2. $\hat{\Sigma}$ and $\sum_{\alpha=1}^{N}(X_\alpha - \bar{X})(X_\alpha - \bar{X})'$ are independently distributed. [Option ID = 38937]
3. None of these. [Option ID = 38938]
4. $\hat{\Sigma}$ is an unbiased estimator for Σ. [Option ID = 38935]

Correct Answer :-

- $\bar{X}$ and $\frac{1}{N}\sum_{\alpha=1}^{N}(X_\alpha - \bar{X})(X_\alpha - \bar{X})'$ are independently distributed. [Option ID = 38936]

17) According to Slutsky's theorem if $X_n \xrightarrow{d} X$, $Z_n \xrightarrow{d} Z$ and $Y_n \xrightarrow{p} a$, where 'd' stands for distribution and 'p' stands for probability, then

1. $Y_nX_n \xrightarrow{d} aX$
2. $Y_nX_n \xrightarrow{p} aX$
3. $X_n+Y_n \xrightarrow{d} X+a$
4. $X_n+Z_n \xrightarrow{d} X+Z$

Which of the above is/are correct?

[Question ID = 17217]

1. Both 1 and 3 [Option ID = 38861]
2. Both 2 and 4 [Option ID = 38862]
3. 2 only [Option ID = 38860]
4. 4 only [Option ID = 38859]

Correct Answer :-

- Both 1 and 3 [Option ID = 38861]

18) Let $\bar{X}$ and A denote, respectively, the sample mean vector and the Wishart matrix obtained from a random sample $X_\alpha(\alpha = 1,2,\ldots,N)$ of size N drawn from $N_p(\mu,\Sigma)$ and let $y = N(\bar{X}-\mu)'A^{-1}(\bar{X}-\mu)$. Then $\frac{(N-p)y}{p}$ is distributed as

[Question ID = 17235]

1. Non-central $F_{p,N-p}(N\mu'\Sigma^{-1}\mu)$ [Option ID = 38932]
2. Central $F_{p,N-p}$ [Option ID = 38931]
3. Central χ^2_p [Option ID = 38933]
4. Non-central $\chi^2_p(N\mu'\Sigma^{-1}\mu)$ [Option ID = 38934]

Correct Answer :-

- Central $F_{p,N-p}$ [Option ID = 38931]

19) The joint probability density function of two random variables X and Y is:

$$f(x,y) = \begin{cases} 24xy, & x > 0, y > 0 \text{ and } x + y < 1 \\ 0, & \text{otherwise.} \end{cases}$$

The value of $E(Var(Y \mid X = x))$ is:

[Question ID = 17209]

1. 3/45 [Option ID = 38828]
2. 1/15 [Option ID = 38830]
3. 1/45 [Option ID = 38827]
4. 2/45 [Option ID = 38829]

Correct Answer :-

- 1/45 [Option ID = 38827]

20) If X, Y, Z are independent and identically distributed standard uniform variates, then the value of $E(1-2U)^2$, where $U = \text{Max}(X, Y, Z)$, is:

[Question ID = 17213]

1. 2/5 [Option ID = 38844]
2. 1 [Option ID = 38843]
3. 3/5 [Option ID = 38846]
4. 1/3 [Option ID = 38845]

Correct Answer :-

- 2/5 [Option ID = 38844]

21) Suppose $X_1, X_2, \ldots, X_n$ is a random sample from $U(0, \theta)$, $\theta > 0$. Then

[Question ID = 17256]

1. X(n) is sufficient statistics of θ [Option ID = 39017]
2. X(n) is not sufficient statistics of θ [Option ID = 39015]
3. X(1) is sufficient statistics of θ [Option ID = 39016]
4. X(1) is MLE of θ [Option ID = 39018]

Correct Answer :-

- X(n) is sufficient statistics of θ [Option ID = 39017]

22) Suppose that a parallel system is composed of two identical components, each with failure rate λ=0.01. The system reliability for t=10 hours is

[Question ID = 17252]

1. 0.89 [Option ID = 39001]
2. 0.79 [Option ID = 39000]
3. 0.69 [Option ID = 38999]
4. 0.99 [Option ID = 39002]

Correct Answer :-

- 0.99 [Option ID = 39002]

23) If $\sqrt{n}\,(Y_n - \mu) \sim N(0, \sigma^2)$ and if 'g' is a differentiable function such that $g'(\mu) = 0$ and $g''(\mu)$ exits and is not 0,then by Delta method $n\left(g(Y_n)\text{-}g(\mu)\right)$ converges in distribution to

[Question ID = 17219]

1. $\frac{\sigma^2 g''(\mu)}{2}$ [Option ID = 38869]
2. $\frac{\sigma^2 g''(\mu)}{2}\chi_1^2$ [Option ID = 38867]
3. χ_1^2 [Option ID = 38868]
4. $\sigma^2 g''(\mu)$ [Option ID = 38870]

Correct Answer :-

- $\frac{\sigma^2 g''(\mu)}{2}\chi_1^2$ [Option ID = 38867]

24) Which one of the following distributions belong to the exponential family of distributions?

[Question ID = 17214]

1. logistic distribution [Option ID = 38848]
2. Uniform$(0, \theta)$ distribution [Option ID = 38847]
3. Beta distribution [Option ID = 38849]
4. Cauchy distribution [Option ID = 38850]

Correct Answer :-

- Beta distribution [Option ID = 38849]

25) The approximate relationship between Durbin Watson d- statistic and sample first order correlation coefficient $\hat{\rho}$ (an estimator of ρ) is:

[Question ID = 17240]

1. $d \approx 1- \hat{\rho}$ [Option ID = 38953]
2. $d \approx \frac{\hat{\rho}}{2}$ [Option ID = 38954]
3. $d \approx 1- 2\hat{\rho}$ [Option ID = 38951]
4. $d \approx 2(1- \hat{\rho})$ [Option ID = 38952]

Correct Answer :-

- $d \approx 2(1- \hat{\rho})$ [Option ID = 38952]

26) Starting at time $t = 0$, visitors enter a museum according to a Poisson process with rate 2. Each visitor spends a random time in the museum that is uniformly distributed between 0 and 1. Determine the expected number of visitors in the museum at time $t = 5$.

[Question ID = 17225]

1. 5 [Option ID = 38893]
2. None of these [Option ID = 38894]
3. 1 [Option ID = 38892]
4. 2 [Option ID = 38891]

Correct Answer :-

- 1 [Option ID = 38892]

27)

If immigrants arrive in a locality A at a Poisson rate of 10 per week and each immigrant is of African origin with probability 1/12, then find the probability that no person of African origin will emigrate to locality A during the month of February.

[Question ID = 17222]

1. e^{-10} [Option ID = 38879]
2. $e^{-10/3}$ [Option ID = 38881]
3. None of these [Option ID = 38882]
4. $e^{-5/6}$ [Option ID = 38880]

Correct Answer :-

- $e^{-10/3}$ [Option ID = 38881]

28) For any random variable X, let $G(t) = E(t^X)$, then the value of $\lim_{t \to 1} \frac{1-G(t)}{1-t^2}$ is:

[Question ID = 17211]

1. E(X)/2 [Option ID = 38837]
2. – E(X) [Option ID = 38838]
3. E(X) [Option ID = 38835]
4. 2E(X) [Option ID = 38836]

Correct Answer :-

- E(X)/2 [Option ID = 38837]

29) The univariate analogue of Wishart distribution is

[Question ID = 17237]

1. Exponential distribution [Option ID = 38939]
2. F – distribution [Option ID = 38941]
3. t – distribution [Option ID = 38940]
4. Chi – square distribution. [Option ID = 38942]

Correct Answer :-

- Chi – square distribution. [Option ID = 38942]

30) To reduce the number of lags in Distributed lag models

[Question ID = 17239]

1. Method of Instrumental Variables is used [Option ID = 38950]
2. Either Koyck's transformation or Almon's approach can be used [Option ID = 38949]
3. Almon's approach is used [Option ID = 38948]
4. Kocyk's transformation is used [Option ID = 38947]

Correct Answer :-

- Kocyk's transformation is used [Option ID = 38947]

31) Which of the following processes are not second-order stationary:

[Question ID = 17224]

1. $Y_n = X_n + a X_{n-1}$ where $\{X_n : n \geq 1\}$ is a sequence of independent and identically distributed random variables and a is a real constant. [Option ID = 38888]
2. $\{X_n : n \geq 1\}$ be uncorrelated random variables with mean 0 and variance 1. [Option ID = 38889]
3. $X_t = Z_1 \cos(\lambda t) + Z_2 \sin(\lambda t)$; $\lambda, t \in R$ and Z_1, Z_2 are independent normally distributed with mean 0 and variance σ^2. [Option ID = 38887]
4. None of these [Option ID = 38890]

Correct Answer :-

- None of these [Option ID = 38890]

32) Method of Indirect Least Squares for estimation is appropriate when

[Question ID = 17243]

1. None of these [Option ID = 38966]
2. simultaneous equations are unidentified [Option ID = 38965]
3. simultaneous equations are exactly identified [Option ID = 38964]
4. simultaneous equations are over identified [Option ID = 38963]

Correct Answer :-

- simultaneous equations are exactly identified [Option ID = 38964]

33) In ARIMA(p,d,q) model, p is:

[Question ID = 17241]

1. the degree of differencing [Option ID = 38956]
2. the order of the autoregressive model [Option ID = 38955]
3. the order of the moving-average model [Option ID = 38957]
4. None of these [Option ID = 38958]

Correct Answer :-

- the order of the autoregressive model [Option ID = 38955]

34) Let us consider a Markov chain with state space S = {0,1,2,3}and associated probability transition matrix

$$P = \begin{pmatrix} 0 & 0.5 & 0 & 0.5 \\ 0.5 & 0 & 0.5 & 0 \\ 0 & 0 & 0.5 & 0.5 \\ 0 & 0 & 0.5 & 0.5 \end{pmatrix}.$$

For a Markov chain starting from state 0, determine the expected number of visits that the chain makes to state 0 before reaching a recurrent class.

[Question ID = 17220]

1. 4/3 [Option ID = 38874]
2. 1/2 [Option ID = 38871]
3. 3/4 [Option ID = 38873]
4. 2/3 [Option ID = 38872]

Correct Answer :-

- 4/3 [Option ID = 38874]

35) The joint distribution of the number of deaths in a life table is

[Question ID = 17250]

1. Binomial [Option ID = 38991]
2. Negative binomial [Option ID = 38993]
3. Multinomial [Option ID = 38992]
4. Normal [Option ID = 38994]

Correct Answer :-

- Multinomial [Option ID = 38992]

36) Under Type I censoring

1. Number of failures is fixed
2. Number of failures is a random variable
3. Time t_0 is fixed
4. Time t_0 is a random variable

Which of the above is/are correct?

[Question ID = 17218]

1. Both 1 and 3 [Option ID = 38865]
2. Both 1 and 4 [Option ID = 38866]
3. 4 only [Option ID = 38863]
4. Both 2 and 3 [Option ID = 38864]

Correct Answer :-

- Both 2 and 3 [Option ID = 38864]

37) If all the $v-1$ non-zero characteristic roots of the C-matrix of a design are equal to θ, then each elementary contrast $\tau_i - \tau_j$ is estimated with a variance:

[Question ID = 17226]

1. $\frac{\sigma^2}{\theta}$ [Option ID = 38895]
2. $\frac{2\sigma^2}{\theta}$ [Option ID = 38896]
3. $\frac{2\sigma^2}{\theta^2}$ [Option ID = 38898]
4. $\frac{\sigma^2}{2\theta}$ [Option ID = 38897]

Correct Answer :-

- $\frac{2\sigma^2}{\theta}$ [Option ID = 38896]

38) It is decided to accept a product with variability ±3σ. Assuming a normally distributed controlled process, the number of rejects, on an average, expected in a population of 1,00,000 is

[Question ID = 17247]

1. 300 [Option ID = 38982]

2. 200 [Option ID = 38979]
3. 250 [Option ID = 38980]
4. 270 [Option ID = 38981]

Correct Answer :-

. 270 [Option ID = 38981]

39) Let $X_1, X_2, \ldots, X_n$ be iid exp(λ) random variables. Then the unbiased estimator of λ based on $Y=\text{Min}(X_1, X_2, \ldots, X_n)$ is:

[Question ID = 17254]

1. nY. [Option ID = 39010]
2. $\frac{Y}{n}$ [Option ID = 39008]
3. $\frac{n}{Y}$ [Option ID = 39009]
4. Y [Option ID = 39007]

Correct Answer :-

. nY. [Option ID = 39010]

40) The mean of a truncated standard normal distribution truncated at both ends, with relevant range of variation as (A, B) is

[Question ID = 17215]

1. $\frac{\phi(B)}{\Phi(A)-\Phi(B)}$ [Option ID = 38852]
2. None of these [Option ID = 38854]
3. $\frac{\phi(A)}{\Phi(A)-\Phi(B)}$ [Option ID = 38851]
4. $\frac{\phi(A)-\phi(B)}{\Phi(A)-\Phi(B)}$ [Option ID = 38853]

Correct Answer :-

. None of these [Option ID = 38854]

41) Non-sampling errors are caused due to:

1. Response Errors
2. Non- responses
3. Sampling Method
4. Processing of data Code

Which of the above statements are correct?

[Question ID = 17245]

1. 1 and 2 only [Option ID = 38972]
2. 1 and 4 only. [Option ID = 38971]
3. 2, 3 and 4 only. [Option ID = 38974]
4. 1, 2 and 4 only [Option ID = 38973]

Correct Answer :-

- 1, 2 and 4 only [Option ID = 38973]

42) Consider a 2^{7-2} fractional factorial design obtained using design generators F =ABCD and G=CDEF.What is the resolution of the design?

[Question ID = 17230]

1. None of these [Option ID = 38914]
2. III [Option ID = 38912]
3. V [Option ID = 38911]
4. IV [Option ID = 38913]

Correct Answer :-

- IV [Option ID = 38913]

43) Given p_0=0.01, α=0.05, p_1=0.06, β=0.10, the OC function of a sequential sampling plan at producer risk point is

[Question ID = 17249]

1. 0.90 [Option ID = 38989]
2. 0.95 [Option ID = 38990]
3. 0.01 [Option ID = 38987]
4. 0.10 [Option ID = 38988]

Correct Answer :-

- 0.95 [Option ID = 38990]

44) Let X, Y, Z are independent and identically distributed standard normal variates and $(X+\theta Z, Y+\theta Z)$ follows bivariate normal distribution with correlation coefficient 0.25. Then the absolute value of θ is:

[Question ID = 17210]

1. $\frac{1}{\sqrt{2}}$ [Option ID = 38831]
2. $\frac{1}{\sqrt{3}}$ [Option ID = 38832]
3. $\frac{1}{\sqrt{2}+1}$ [Option ID = 38833]
4. $\frac{1}{\sqrt{3}+1}$ [Option ID = 38834]

Correct Answer :-

- $\frac{1}{\sqrt{3}}$ [Option ID = 38832]

45) If method of ordinary least squares is applied to Simultaneous equations model, then the estimates of parameters are:

[Question ID = 17238]

1. Biased and not Consistent [Option ID = 38946]
2. Unbiased [Option ID = 38943]
3. Biased and Consistent [Option ID = 38944]

4. Consistent [Option ID = 38945]

Correct Answer :-

- Biased and not Consistent [Option ID = 38946]

46) Let $X_1, X_2, \ldots, X_n$ be iid Poisson(λ). Suppose $\bar{X}$ and S^2 denote respectively, the sample mean and the sample variance. Then

[Question ID = 17255]

1. $\bar{X}$ is unbiased and S^2 is biased estimator of λ. [Option ID = 39011]
2. Variance of $\bar{X}$ is less than variance of S^2 [Option ID = 39012]
3. Variance of $\bar{X}$ is greater than variance of S^2 [Option ID = 39014]
4. $\bar{X}$ is biased and S^2 is unbiased estimator of λ. [Option ID = 39013]

Correct Answer :-

- Variance of $\bar{X}$ is less than variance of S^2 [Option ID = 39012]

47) A population closed to migration with time independent constant birth and death rate is called

[Question ID = 17251]

1. Stationary [Option ID = 38995]
2. None of these [Option ID = 38998]
3. Normal [Option ID = 38997]
4. Stable [Option ID = 38996]

Correct Answer :-

- Stable [Option ID = 38996]

48) For a 2^6 factorial experiment conducted in 8 blocks of size 8 each, the contents of the key block are 000000, 001101, 010111, 100011 and four more. Which of the following three factor interactions is not confounded?

[Question ID = 17228]

1. ADE [Option ID = 38905]
2. BCD [Option ID = 38903]
3. CEF [Option ID = 38906]
4. ABE [Option ID = 38904]

Correct Answer :-

- ADE [Option ID = 38905]

49) Which one of the following statements regarding Brownian motion is false? [Question ID = 17221]

1. Brownian sample functions are of bounded variation with increasing variance. [Option ID = 38875]
2. Brownian motion satisfies time reversal property. [Option ID = 38877]
3. Brownian motion is continuous analogue of discrete random walk. [Option ID = 38878]
4. Finite dimensional distributions of Brownian motion are tractable. [Option ID = 38876]

Correct Answer :-

- Brownian sample functions are of bounded variation with increasing variance. [Option ID = 38875]

50) The requirements for using stratified random sampling are given as follows:

1. Strata should be non-overlapping.
2. Stratum sizes and sampling frame for each stratum should be known.
3. SRSWOR method is used for selecting sample from each stratum.

4. Population should be homogenous

Which of the statements given above are correct?

[Question ID = 17246]

1. 1, 3 and 4 only. [Option ID = 38978]
2. 1, 2 and 4 only [Option ID = 38976]
3. 1, 2 and 3 only [Option ID = 38975]
4. 2, 3 and 4 only [Option ID = 38977]

Correct Answer :-

- 1, 2 and 3 only [Option ID = 38975]