Examination: **Ph.D. Statistics**

Section 1 - Section 1

Question No.1 — 4.00

Bookmark ☐

Let {Xn} be a strictly decreasing sequence of positive random variables, and suppose that Xn converges to zero in probability. Which of the following are also true:

- Xn converges to some positive quantity
- Xn converges almost surely
- Xn converges everywhere
- Xn converges in distribution

Question No.2 — 4.00

Bookmark ☑

Let N(t) be a Poisson process with constant intensity function on R. What is the covariance of N(s) and N(t)?

- $\lambda(s-t)$, if $(t<s)$
- λs, if $s<t$
- $\lambda(t-s)$, if $s<t$
- $\lambda(s+t)$

Question No.3 — 4.00

Bookmark ☑

The trend equation correspond to 1981 as the origin is Y = 148.8 +7.2 X. The monthly trend equation if X unit = 1 year and Y = annual demand is

- Y = 148.8 + 0.6X
- Y = 148.8 + 0.05X
- Y = 12.4 + 0.05X
- Y = 12.4 + 0.6X

Question No.4 — 4.00

Bookmark ☐

The following statements given in respect of Maximum Likelihood Estimation (MLE):
I. MLE's are always unique.
II. MLE's are not necessarily unbiased.
III. MLE's satisfies invariance property, provided the transformation is one-to-one.
Which of the above are correct?

- Only II and III are correct
- All are correct
- Only I and III are correct
- Only I and II are correct

Question No.5 — 4.00

Bookmark ☐

If the percent of trend for a year in a time series is greater than 100%, it indicates that

- The actual time series value lies above the trend line and the relative cyclical residual is positive
- The actual time series value lies above the trend line and the relative cyclical residual is negative
- The actual time series value lies below the trend line and the relative cyclical residual is positive
- The actual time series value lies below the trend line and the relative cyclical residual is negative

Question No.6 — 4.00

Bookmark ☑

Regression modelling is a statistical framework for developing a mathematical equation that describes how

- One response and one or more explanatory variables are related
- One explanatory and one or more response variables are related
- Several explanatory and several response variables response are related
- All of these are correct.

Question No.7 — 4.00

Bookmark ☐

Choose the best synonym of the italicized word

Choose the best synonym of the italicized word.
Dr. Elango is in the habit of using *obsolete* words.

- simple
- difficult
- wrong
- outdated

Question No.8 4.00

Bookmark ☐

Let θ be an unknown parameter and T_1 be an unbiased estimator of θ. If $V(T_1) \leq V(T_2)$, where T_2 to beany other unbiased estimator, then T_1 is known as:

- Minimum variance unbiased estimator
- Unbiased, consistent and minimum variance estimator
- Consistent and efficient estimator
- Unbiased and efficient estimator

Question No.9 4.00

Bookmark ☑

Cpk value of 1.67 means

- process is not capable and needs improvement
- process is capable and repeatable
- process is capable but may not be repeatable
- none of the above

Question No.10 4.00

Bookmark ☐

Study the following information carefully and answer the question below it

Lakshman passes through seven lanes to reach his school. He finds that 'Truth lane' is between his house and 'Lie lane'. The third lane from his school is 'Karma lane'. 'Dharma lane' is immediately before the 'Yog lane'. He passes 'Salvation lane' at the end, 'Lie lane' is between 'Truth lane' and 'Dharma lane', the sixth lane from his house is 'Devotion lane'.

If Lakshman's house, each lane and his school are equidistant and he takes 2 minutes to pass one lane, then how long will he take to reach school from his house?

- 13 minutes
- 14 minutes
- 16 minutes
- 15 minutes

Question No.11 4.00

Bookmark ☐

When their father died, their elder brother sold the old house and _____ in a small flat in a far-off suburb

- set them down
- put them down
- put them up
- set them up

Question No.12 4.00

Bookmark ☑

This is the school where I studied till class 5.
The underlined word is a

- adjective
- pronoun
- adverb
- preposition

Question No.13 4.00

Bookmark ☐

A single equation econometric model of the demand for a product is a _____ equation in which the quantity demanded of the product is an _____ variable

- definitional, endogeneous
- structural, endogeneous
- definitional, exogeneous
- structural, exogeneous

Question No.14 4.00

Bookmark ☐

A pessimistic decision making criterion is

- ○ Equally likely
- ○ Maximax
- ○ Maximin
- ○ Decision making under certainty

Question No.15 4.00

Bookmark ☐

The special case of Birth-Death process with $\lambda_n = n\lambda$ is called the _____process

- ○ Poisson
- ○ Yule-Furry
- ○ Immigration
- ○ Linear growth

Question No.16 4.00

Bookmark ☑

If $n=15, \sum x = 480, \sum x^2$, then the standard deviation of y=5x-10 is

- ○ 112.88
- ○ 47.56
- ○ 100
- ○ 96.82

Question No.17 4.00

Bookmark ☑

Let $X_1, X_2, \ldots$ be iid Poisson (λ) random variables. If $S_n = \sum_{k=1}^{n} X_k$. If λ=1 and n=64, then

The value of $P\{50 < S_n < 80\}$ is approximately

- ○ 0.9348
- ○ 0.7884
- ○ 0.7329
- ○ 0.8321

Question No.18 4.00

Bookmark ☐

Let N be number of units in a population. After the selection of one unit from the population, every k^{th} ($k < n$) unit is selected to obtain a sample of size n. Let ρ be the interclass correlation between the units of the same systematic sample. If $\rho = 1$, then the relative precision of the systematic sample with simple random sampling is:

- ○ a function of N only
- ○ a function of N and k only
- ○ a function of N and n only
- ○ a function of N,n and k

Question No.19 4.00

Bookmark ☐

Given the following statements about a one parameter exponential family of distribution:

I. It always admits sufficient statistics.

II. The moment estimator $\hat{\theta}$ based on sufficient statistics is CAN for θ.

III. The asymptotic variance attains CRLB.

Which of the above are correct:

- ○ Only I and II are correct
- ○ Only II and III are correct
- ○ Only I and III are correct
- ○ All are correct

Question No.20 4.00

Bookmark ☑

If V be a collection of vectors, then V is said to be subspace, if

- V is closed under scalar multiplication
- V is closed under multiplication
- V is closed under multiplication and addition
- V is closed under addition and scalar multiplication

Question No.21 4.00

Bookmark ☑

The probability of extinction for a linear growth process with birth rate equal to death rate is

- 0
- 1
- 1/2
- less than one

Question No.22 4.00

Bookmark ☐

Let X and Y be two random variableshaving a joint density function f(x, y). Then to obtain the density of U = X+Y, the Jacobian of transformation is :

- Either -1 or 1
- 0.5
- 1
- -1

Question No.23 4.00

Bookmark ☑

The test for variance which is not robust against deviations from normality

- Chi-Square test
- Z-test
- Bartlett's test
- F-test

Question No.24 4.00

Bookmark ☐

In a design of experiments with 5 factors each considered at 2 levels, the key block is given as: (1), BC, DE, BCDE, ABD, ACD, ABE, ACE. Which one of the following gives confounded interactions?

- ADE, ABCD, BCE
- ABC, ADE, DCBE
- ACE, ABD, BCDE
- ABC, ACE, BCDE

Question No.25 4.00

Bookmark ☐

If regression analysis is used to estimate the linear relationship between the natural logarithm of the variables to be forecast and time, then the slope estimate is equal to:

- the natural logarithm of the square root of the rate of growth
- the natural logarithm of the rate of growth
- the linear trend
- the natural logarithm of one plus the rate of growth

Question No.26 4.00

Bookmark ☐

Being awarded the Best Singer in 2010 marked a _____ in her life.

- milestone
- yardstick
- sign-post
- memorial

Question No.27 4.00

Bookmark ☑

- 1
- 4
- 3
- 2

Question No.28 4.00

Bookmark ☐

Statement: Apart from it's entertainment value of Television, it's educational value cannot be ignored
Assumptions:
I. People take Television to be the means of entertainment only.
II. The educational value of Television is not realized properly

- If only assumption I is implicit
- If neither I nor II is implicit
- If only assumption II is implicit
- If both I and II are implicit

Question No.29 4.00

Bookmark ☐

The measure of Kurtosis of t-distribution is

- $\frac{3(n-2)}{n+4}$
- $\frac{n-2}{n-3}$
- $\frac{3(n-2)}{n-4}$
- $\frac{n+2}{n+4}$

Question No.30 4.00

Bookmark ☐

Economic forecasts require

- Accurate estimates of the coefficients of structural coefficients
- forecasts of future values of exogeneous variables
- appropriate theoretical models
- all of the above

Question No.31 4.00

Bookmark ☑

Study the following information carefully and answer the question below it

The Director of an MBA college has decided that six guest lectures on the topics of Motivation, Decision Making, Quality Circle, Assessment Centre, Leadership and Group Discussion are to be organised on each day from Monday to Sunday.
(i) One day there will be no lecture (Saturday is not that day), just before that day Group Discussion will be organised.
(ii) Motivation should be organised immediately after Assessment Centre.
(iii) Quality Circle should be organised on Wednesday and should not be followed by Group Discussion
(iv) Decision Making should be organised on Friday and there should be a gap of two days between Leadership and Group Discussion

Which of the following information is not required for the above lecture arrangements?

- Only (i)
- Only (ii)
- Only (iii)
- All are required

Question No.32 4.00

Bookmark ☐

The goodness of fit of the fitted regression model can be checked from the value of

- Residual sum of squares.
- Coefficient of determination
- Regression coefficient
- Coefficient of correlation

Question No.33 4.00

Bookmark ☐

If $A=\begin{bmatrix} 2 & -2 & -4 \\ -1 & 3 & 4 \\ 1 & -2 & x \end{bmatrix}$ is an idempotent matrix, then the value of x is

- -1
- -3
- -5
- 3

Question No.34 4.00

Bookmark ☐

In many situations managers resort to sampling to draw some conclusions about a population. Which of the following is not an advantage of sampling over a census?

- Sampling usually provides information quicker than a census
- A study of sample is usually cheaper than a census
- The conclusions obtained from sampling are more accurate than census.
- In destructive testing sampling is the only available course

Question No.35 4.00

Bookmark ☐

Correct the error in the italicized part of the sentence by choosing the most appropriate options
Job was a tiny man, barely five feet tall, with *a spright walk*

- spright walk
- a sprightly walking
- spright walkingly
- a sprightly walk

Question No.36 4.00

Bookmark ☐

In decision making under _____there are several possible outcomes for each alternative, and the decision maker knows the probability occurrence of each outcome:

- Risk
- Probability
- Certainty
- Utility

Question No.37 4.00

Bookmark ☐

The equations 2x+5=5, x+3y=5, x-2y=0 have _____ number of solutions

- one
- zero
- two
- many

Question No.38 4.00

Bookmark ☐

Select the Pair that best respresents the relationship that is given in the question:
Explore : Discover

- Tree : Wood
- Think : Relate
- Research : Learn
- Books : Knowledge

Question No.39 4.00

Bookmark ☑

If X and Y are 2 Gamma Variates $\Gamma(n_1)$ and $\Gamma(n_2)$ then the distribution of X/Y is

- $\beta_{11}(n_1 + n_2)$
- $F_{(n_1,n_2)}$
- $\Gamma(n_1 + n_2)$
- $\beta_1(n_1 + n_2)$

Question No.40 4.00

Bookmark ☐

Let X be a random variable with probability generating function (pgf), P(S). Then the pgf of 2X+1 is

- SP(S)
- P(S)/S
- S/P(S)
- SP(S2)

Question No.41 4.00

Bookmark ☑

The UCL and LCL of a basic mean chart is given as 12 and 8 respectively. If variance of the process is given as 16, then what is the sample size of the process?

- 28
- 18
- 36
- 25

Question No.42 4.00

Bookmark ☐

Given that a and b are real numbers, let $f(a,b) = ab$ and let $g(a) = a^2+2$. What is $f(3,g(3))$?

- 33
- 38
- 27
- 30

Question No.43 4.00

Bookmark ☐

Crumb : Bread ::

- Tea : Cup
- Flower : Vase
- Splinter : Wood
- Water : Bucket

Question No.44 4.00

Bookmark ☐

Suppose an absent minded officer puts four letters in 4 addressed envelopes. What is the probability that he will misplace every letter?

- 19/24
- 3/8
- 5/24
- 5/8

Question No.45 4.00

Bookmark ☐

For a single sampling inspection plan, it is given that $N = 100, n = 20$ and p=0.02.
If $P_a = 0.64$, then what is the value of ATI?

- 45
- 38

- 49
- 30

Question No.46 4.00

Bookmark

Choose the best synonym of the italicized word.
Children of excessively indulgent parents often become very *recalcitrant.*

- insolent
- indolent
- disobedient
- dependent

Question No.47 4.00

Bookmark

The ratio of number of replication required in CRD and RBD for the same amount of information is

- 5:4
- 3:5
- 5:3
- 3:2

Question No.48 4.00

Bookmark

Let $X_1, X_2, \ldots X_n$ be iid with $f(x) = \theta x^{\theta-1}, 0 < x < 1, \theta > 0$. Then the Cramer-Rao Lower Bound for estimating θ is

- $n\theta$
- $\frac{\theta^2}{n}$
- $\frac{\theta}{n}$
- $\frac{\theta^2}{n^2}$

Question No.49 4.00

Bookmark

Let T be CAN for θ so that $T \sim AN(\theta, \sigma_T^2(\theta)/a_n^2)$ and let Ψ be a differentiable function such that $\frac{d\psi}{d\theta}$ is continuous and non vanishing then Ψ(T) is CAN for Ψ(θ) with asymptotic variance:

- $\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^4(\theta)}{a_n^4}$
- $\left(\frac{d\psi}{d\theta}\right)^2 a_n^2 \sigma_T^2(\theta)$
- $\left(\frac{d\psi}{d\theta}\right)^2 \frac{\sigma_T^2(\theta)}{a_n^2}$
- $\left(\frac{d\psi}{d\theta}\right)^2 \sigma_T^2(\theta)$

Question No.50 4.00

Bookmark ☐

Rectified sampling plans are designed to answer

- Rejected lots
- Small lots
- Accepted lots
- Subgroup lots

Question No.51 4.00

Bookmark ☑

If $X \sim Poisson(4)$ and $Y \sim Poisson(3)$, and X and Y are independent. What is the value of E[X|(X+Y)], if $n = 10$?

- 6.23
- 4.23
- 5.71
- 5.32

Question No.52 4.00

Bookmark ☑

The quadratic form $6x_1^2 + 3x_2^2 + 14x_3^2 + 4x_2x_3 + 18x_1x_3 + 4x_1x_2$ is

- Positive semi definite
- Negative semi definite
- Negative definite
- Positive definite

Question No.53 4.00

Bookmark ☐

Based on the information given answer the following question.
1. In a family of six persons, there are people from three generations. Each has separate professions and they like different colours. There are two couples.
2. Shyam is an Engineer and his wife is not a doctor and she does not like Red colour.
3. Chartered Accountant likes green colour and his wife is a teacher.
4. Manisha is the mother-in-law of Sunita and she likes orange colour.
5. Vimal is the grand father of Tarun and tarun is the Principal and likes black colour.
6. Nyna is the grand daughter of Manisha and she likes blue colour. Nyna's Mother likes white colour.

What is the profession of Sunita?

- Teacher
- Principal
- Chartered Accountant
- Cannot be determined

Question No.54 4.00

Bookmark ☐

What assumptions does ANCOVA have that ANOVA does not?

- Homoscedasticity
- Homogeneity of variance
- Homogeneity of regression slopes
- Homogeneity of sample size

Question No.55 4.00

Bookmark ☐

A set of logical and mathematical operations performed in a specific sequence is called:

- Complete enumeration
- Algorithm
- Objective
- Diagnostic analysis

Question No.56 4.00

Bookmark ☐

Consider the following statements:
I. A complete class of decision rules contains only admissible decision rules
II. A minimal complete class of decision rule contains only admissible decision rules
III. A minimal complete class of decision rule is always complete
Which of the above is correct?

- Only I is correct
- Both II and III is correct
- only II is correct
- Both I and II is correct.

Question No.57 4.00

Bookmark

The probability distribution function which is not a member of exponential family but satisfies monotonic likelihood ratio property is

- Hypergeometric
- Poisson
- Binomial
- Normal

Question No.58 4.00

Bookmark

Lots are defined as bad quality, if the proportion of defectives are greater than a specified number known as

- AOQ
- LTPD
- AOQL
- ATI

Question No.59 4.00

Bookmark

Statement: Ten Candidates, who were on the waiting list could finally be admitted to the course.
Assumptions:
I. A large of number of candidates were on the waiting list.
II. Wait listed candidates do not ordinarily get admission.

- If neither I nor II is implicit
- If only assumption I is implicit
- If only assumption II is implicit
- If both I and II are implicit

Question No.60 4.00

Bookmark

If X and Y are two independent non negative integer valued random variables such that P(X=k)>0 & P(Y=k)>0 for k=0, 1, 2,… and the conditional distribution of X/X+Y is binomial, then

- X is Binomial and Y is Poisson
- Both X and Y are Binomial
- Both X and Y are Poisson
- X is Poisson and Y is Binomial

Question No.61 4.00

Bookmark

Wishart distribution is a generalization of

- t-distribution
- Normal distribution
- Beta distribution
- Chi-square distribution

Question No.62 4.00

Bookmark

Which of the following techniques yields a simple random sample?

- Choosing volunteers from an introductory psychology class to participate
- Numbering all the elements of a sampling frame and then using a random number table to pick cases from the table.
- Listing the individuals by ethnic group and choosing a proportion from within each ethnic group at random.
- Randomly selecting schools, and then sampling everyone within the school.

Question No.63 4.00

Bookmark

Let T be an estimator based on a sample $X_1, X_2, \ldots, X_n$ from a distribution with parameter θ.
Then T is a consistent estimator of θ if :

- $P\{T-\theta>\epsilon\} = 0$, for all $\epsilon > 0$
- $P\{|T-\theta| >\epsilon\} = 0$
- $\lim_{n\to\infty} P\{T - \theta < \epsilon\} = 0$, for all $\epsilon > 0$
- $\lim_{n\to\infty} P\{|T - \theta| > \epsilon\} = 0$, for all $\epsilon > 0$

Question No.64 4.00

Bookmark

Suppose X is a Gamma distribution with pdf:

$$f(x)=\frac{1}{\theta^{\beta}\Gamma(\beta)}x^{\beta-1}e^{-x/\theta}, x \geq 0, \theta, \beta > 0$$

The moment estimator of β is

- $\frac{m_1'^2}{m_2' - m_1'}$
- $\frac{m_1'}{m_2' - m_1'}$
- $\frac{m_1'^2}{m_2' - m_1'^2}$
- $\frac{m_1'}{m_2' - m_1'^2}$

Question No.65 4.00

Bookmark

Every sequence {Xn} of independent random variables with uniformly bounded variances obeys

- SLLN
- WLLN
- Borel-Cantelli lemma
- Cauchy's criterion

Question No.66 4.00

Bookmark

Let $X_1, X_2, \ldots, X_n$ be 'n' independent random variables. Let $a_1, a_2, \ldots, a_n$ and $b_1, b_2, \ldots, b_n$ be real numbers such that none of which equals zero. If $\sum_{i=1}^{n} a_i X_i$ and $\sum_{i=1}^{n} b_i X_i$ are independent, then

- all the variables are normally distributed
- the variables need not be normally distributed
- some of the variables are normally distributed
- all the variables are uniformly distributed

Question No.67 4.00

Bookmark

In the following Transition Probability Matrix, identify the closed class, when the state space is S={1, 2, 3, 4} and P = $\begin{bmatrix} 1/3 & 1/3 & 0 & 1/3 \\ 0 & 1/2 & 1/2 & 0 \\ 0 & 1/3 & 2/3 & 0 \\ 1/6 & 3/6 & 2/6 & 0 \end{bmatrix}$

- {2,3}
- {1,2}
- {1,4}
- {2,4}

Question No.68 4.00

Bookmark

An inspection of 10 samples of size 400 each from 10 lots revealed the following defective units: 17, 15, 14, 26, 9, 4, 19, 12, 9, 15 The upper control limit for number of defective is:

- 23.32
- 25.03
- 21.45
- 18.95

Question No.69 4.00

Bookmark

If $\{N(t), t \geq 0\}$ is a Poisson process, then $X(t) = N(t + L) - N(t)$, where L is positive constant is _____ stationary.

- evolutionary
- covariance
- strongly
- weakly

Question No.70 4.00

Bookmark

The AQL of a process is

- the highest fraction defective that is unacceptable to the customer
- the lowest fraction defective that is unacceptable to the customer
- the lowest fraction defective that is acceptable to the customer
- the highest fraction defective that is acceptable to the customer

Question No.71 4.00

Bookmark

Let $\{X_n\}$ be any sequence of random variables, then for the sequence of $\{X_n\}$ to satisfy the Weak Law of Large Numbers, the condition for $Y_n = \frac{1}{n}\sum_k X_k$ that $E\left\{\frac{Y_n^2}{1+Y_n^2}\right\} \to 0$ as

- Neither necessary nor Sufficient condition
- Necessary and sufficient condition
- Necessary condition
- Sufficient condition

Question No.72 4.00

Bookmark

If the responses for treatments in a factorial experiment with factors A and B each at 2 levels from 3 replications are $a_0b_0 = 18$, $a_1b_0 = 17$, $a_0b_1 = 25$ and $a_1b_1 = 30$, the sum of squares for interaction AB equal to

- 675
- 3
- 4
- 6

Question No.73 4.00

Bookmark

If the periodicity of the state J, $d_J = GCD\ \{n:p_{JJ}^{(n)}>0\}$ is equal to unity then state J is known as:

- Absorbing
- Periodic
- Aperiodic
- Closed

Question No.74 4.00

Bookmark

If after performing a student-test for comparison of means, we obtain p=0.0256, then

- we reject H0 and accept H1
- we cannot decide
- we accept H0
- we reject H1

Question No.75 4.00

Bookmark

If for a bivariate data the correlation coefficient is 0.8, the percentage of variation in the response variable explained by the variation in the explanatory variable is

- 64%
- 0.80%
- 80%
- 0.64%

Question No.76 4.00

Bookmark

Which one of the following allocation procedures can be used when no other information except the total number of units in the stratum is given?

- Equal Allocation
- Proportional Allocation
- Optimum Allocation
- Neyman Allocation

Question No.77 4.00

Bookmark

Given that $X_1, X_2, \ldots X_n$ be iid with U(0,θ) and $\hat{\theta} = X_{(n)}$. Which of the following is TRUE?

- $\hat{\theta}$ is consistent and not Asymptotically Normal

- $\hat{\theta}$ is consistent and Asymptotically Normal
- $\hat{\theta}$ is not consistent and unbiased
- $\hat{\theta}$ is consistent and unbiased

Question No.78 4.00

Bookmark

If (X, Y) has a Bivariate Normal with parameters μ_1, μ_2, σ_1^2, σ_2^2 and ρ, then Var(Y/X=x) is

- $\sigma_2^2(1-\rho^2)$
- $\sigma_2^2\rho^2$
- $\sigma_1^2(1-\rho^2)$
- $\sigma_1^2\rho^2$

Question No.79 4.00

Bookmark

For $S^2 = \frac{\sum_{i=1}^{n}(y_i-\bar{y})^2}{(n-1)}$, an unbiased estimate of the variance of the sample mean in random sampling with replacement is given by

- $\frac{s^2}{n}$
- $\frac{s^2(N-n)}{N}$
- $\frac{s^2}{n-1}$
- $\frac{S^2}{N}$

Question No.80 4.00

Bookmark

Variance of the estimate of the population mean ($\bar{y}_{st}$) is minimum for fixed total size of the sample ' n ' if :

- $n_i \propto N_iS_i$
- $n_i \propto N_i$
- $n_i \propto Ni/Si$
- $n_i \propto n_iS_i$.

Question No.81 4.00

Bookmark

With the usual notations, find p for a binomial random variable X, if n = 6 and if 9 P (X=1) = P(X=2).

- 18/23
- 9/14
- 19/27
- 12/15

Question No.82 4.00

Bookmark

In the analysis of RBD with b blocks and v treatments, the error degrees of freedom are

- v(b-1)
- b(v-1)
- b(v+1)
- (b-1)(v-1)

Question No.83 4.00

Bookmark

Let X be a random variable having the probability function:

$$f(x,\theta)=\binom{n}{x}\theta^x(1-\theta)^{n-x}, x=0,1,2,\ldots,n.$$

If $d(x)=\frac{x}{n}$, then the risk function $R(\theta,d)$ under squared error loss function is:

- $\frac{\theta^2}{n}$
- $\frac{\theta(1-\theta)}{n}$
- $\frac{\theta(\theta+1)}{n}$
- $\frac{\theta(\theta-1)}{n}$

Question No.84 4.00

Bookmark

What can be said about the following data? 15, 17, 21, 25, 30, 36, 41

- No such statement can be made
- Data is positively skewed
- Data is negatively skewed
- Data is symmetric

Question No.85 4.00

Bookmark

Which of the following is an example of ordinal variable?

- Nationality
- Caste
- Date of Birth
- Annual income

Question No.86 4.00

Bookmark

Let there be ‘n’ pedestrians on the side walk at time ‘t’, then the probability of any one of them would leave in the interval (t, t+h) is given by

- O(h)
- $n\mu h+O(h)$
- $n\mu h$

- μh

Question No.87 4.00

Bookmark

Let $\{X_n, Y_n\}$, n=1,2,..., be a sequence of random variables. Then $|X_n-Y_n| \xrightarrow{P} 0$ and $Y_n \xrightarrow{L} Y$ implies

- $Y_n \xrightarrow{L} X$
- $X_n \xrightarrow{L} X$
- $X_n Y_n \xrightarrow{L} Y$
- $X_n \xrightarrow{L} Y$

Question No.88 4.00

Bookmark

Consider the following statements:
I. Least square estimators are unbiased for all general linear models
II. Under fairly general conditions, the estimates obtained by method of moments will have asymptotically normal distribution for large n.
III. The minimum chi-square estimators are not necessarily consistent.
Which of the above are correct?

- Only I and II are correct
- Only II and III are correct
- All are correct
- Only I and III are correct

Question No.89 4.00

Bookmark

She studies very hard for the exams, _____?

- does she?
- doesn't she?
- is it?
- isn't it?

Question No.90 4.00

Bookmark

If A+B means A is daughter of B,
A-B means A is husband of B
A × B means A is brother of B

From the statement A × B × C × D, which of the following statement is not necessarily true?

- D is brother of C
- A, B, C are male
- B is the brother of A
- C is the brother of A

Question No.91 4.00

Bookmark

Nidhi walks 10 metres in front and 10 metres to the right. Then every time turning to her left, she walks 5, 15 and 15 metres respectively. How far is Nidhi now from her starting point?

- 10 metres
- 5 metres
- 15 metres
- None of the above

Question No.92 4.00

Bookmark

A can finish a work in 18 days and B can do the same work in half the time taken by A. Then, working together, what part of the same work they can finish in a day?

- 0 1/6
- 0 1/2
- 0 1/8
- 0 1/4

Question No.93 4.00

Bookmark

Choose the best antonym of the italicized word.
The deliberate *suavity* of Olaf's behavior made the emotions of the audience volatile.

- politeness
- stupidity
- impetuosity
- pleasantness

Question No.94 4.00

Bookmark

Let $X_1, X_2, ...X_n$ be a random sample from a density f(x;θ). If T=t($X_1, X_2, ...X_n$) is a complete sufficient statistic and $S' = s(t)$, a function of T, is an unbiased estimator of $\tau(\theta)$, S' is an UMVUE of $\tau(\theta)$. The above result is due to

- Rao-blackwell Theorem
- Basu's Theorem
- Lehmann-Scheffe Thereom
- Neyman Factorization Theorem

Question No.95 4.00

Bookmark

Suppose a random variable U has a Uniform distribution in the interval (0, 1) and let X= - 2 log U. Then the probability density function of X is

- f(x) = ½ , if xϵ (0, 2)
- f(x) = exp (-x), if x>0
- f(x) = 2exp (-2x), if x>0
- f(x) = ½ exp (-x/2), if x>0

Question No.96 4.00

Bookmark

Which of the following is false with regard to the Simplex method of solving Linear Programming problems?

- It involves an iterative procedure for arriving at the optimal solution
- Slack variables are used to represent the unused resources
- Slack variables make zero contribution towards the objective to be achieved
- The Zj – Cj values indicate the variable to leave solution

Question No.97 4.00

Bookmark

Let $X_{(1)}, X_{(2)}, ..., X_{(r)}$ be a Type-II censored sample when n independent and identical items are put on life test. Define $D_i = (n-i+1)(X_{(i)} - X_{(i-1)}), X_{(0)} = 0. i = 1,2,...,r.$ Then which of the following is TRUE?

- D_i's are dependant exponential random variables
- D_i's are independent exponential random variables
- D_i's are dependant random variables
- D_i's are iid life time random variables

Question No.98 4.00

Bookmark

The distribution of test scores in a class is given as follows:

Number of students	Number of correct answers
10	36 to 40
16	32 to 35
12	28 to 31
14	26 to 27
8	00 to 25

What percentage of the class answered 32 or more questions correctly?

- 43.3
- 26
- 20
- 32.5

Question No.99 4.00

Bookmark

In calculation of control limits 'σ' can be estimated in 2 ways as

- $\hat{\sigma} = \frac{\sigma}{c_2}, \hat{\sigma} = \frac{\bar{X}}{d_2}$
- $\hat{\sigma} = \frac{\bar{R}}{d_1}, \hat{\sigma} = \frac{\bar{\sigma}}{c_1}$
- $\hat{\sigma} = \frac{\bar{R}}{d_2}, \hat{\sigma} = \frac{\bar{\sigma}}{c_2}$
- $\hat{\sigma} = \frac{d_2}{\bar{R}}, \hat{\sigma} = \frac{c_2}{\sigma}$

Question No.100 4.00

Bookmark

Find the odd one out?

- Deduction
- Deposit
- Withdrawal
- Debit