

STA301 QUIZ File

AUGUST 2021

Prepared by

QAISER ABBAS & Friends

β is the probability of:

Select the correct option



Reject H_0/H_0 is true



Reject H_0/H_0 is false



Accept H_0/H_0 is false



Accept H_0/H_0 is true



An estimator is said to be efficient if it has

Select the correct option

☐	Smallest Variance
☐	Unbiased estimate
☒	Both (a) & (b)
☐	None of these

Question # 3 of 10 (Start time: 04:18:34 PM, 21 August 2021)

Conventionally, the probability of making a type-I error is denoted by which of the following symbol?



Select the correct option

☐	σ (sigma)
☐	β (beta)
☐	θ (theta)
☐	α (alpha)

A blue highlight and a checkmark are positioned over the α (alpha) option.

Question # 4 of 10 (Start time: 04:19:24 PM, 21 August 2021)

The end points that bound the confidence interval are called.

Select the correct option

☐	Lower limits
☐	Bounded limits
☒	Lower and upper limits
☐	Upper limits

Question # 2 of 10 (Start time: 04:17:48 PM, 21 August 2021)

An estimator is said to be _____ if its expected value is equal to true value of its parameter.

Select the correct option

☐	Efficient
☐	Consistent
☐	Biased
☐	Unbiased



The width of the confidence interval is called _____ of the estimate.

Select the correct option

☐	Biased
☐	Accuracy
☐	Precision
☐	Unbiasedness

Question # 1 of 10 (Start time: 10:34:23 AM, 18 August 2021)

Total Marks: 1

The width of the confidence interval is called _____ of the estimate.

Select the correct option

☒	Unbiasedness
☐	Precision
☐	Accuracy
☐	Biased

If we draw a sample of size 'n' from a population then sample is called "large sample" if:

Select the correct option

☒	$n > 40$
☐	$n > 30$
☐	$n > 50$
☐	$n > 25$



The method of Maximum Likelihood (ML) is used to find out:

Select the correct option

☐	Sample values
☐	Random numbers
☐	Correlation coefficient
☒	Point estimates



The precision of an estimator can be increased by increasing the;

Select the correct option

☐	Size of sample
☐	Number of estimators
☒	Size of population
☐	Number of parameters

Which of the following is most important and most widely used method in point estimation?

Select the correct option

☐	The method of moments
☐	The method of fractional moments
☐	The method of maximum likelihood
☒	The method of least square

.....

β is the probability of:

Select the correct option

- | | |
|-----------------------|---------------------------|
| ☐ | Reject H_0/H_0 is true |
| ☐ | Reject H_0/H_0 is false |
| ☐ | Accept H_0/H_0 is false |
| ☐ | Accept H_0/H_0 is true |



Sample Proportion is a /an _____ estimator of population mean.

Select the correct option

☐	None of these
☐	Unbiased and Consistent estimator
☐	Unbiased
☒	Consistent



		Decision	
		Accept H_0	Reject H_0 (or accept H_1)
True Situation	H_0 is true	Correct decision (No error)	Wrong decision (Type-I error)
	H_0 is false	Wrong decision (Type-II error)	Correct decision (No error)

that of committing a Type I error is indicated,

$$\begin{aligned}
 \alpha &= P(\text{Type I error}) \\
 &= P(\text{reject } H_0 | H_0 \text{ is true}), \\
 \beta &= P(\text{Type II error}) \\
 &= P(\text{accept } H_0 | H_0 \text{ is false})
 \end{aligned}$$

4G

10:24 PM

4G 62%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 09:00

STAT301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 6 of 10 (Start time: 10:24:45 PM, 20 August 2021)

Total Marks: 1

In a random sample of 500 men from Lahore city, 300 are found to be smokers; the proportion of smokers is equal to:

Select the correct option

- ☒ 0.6
- ☐ 0.3
- ☐ 0.5
- ☐ 0.4

Click and Drag Answer to Move to Next Question



4G

10:25 PM

4G 62%

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MC210203829: ZAIB UN NISA

Time Left: 88 min

STAT01 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 7 of 10 (Start Time: 10:25:24 PM, 20 August 2021)

Total Marks: 1

An experiment was conducted to estimate the mean yield of a new variety of wheat. A sample of 20 plots gave a mean yield of 2.9, and a 95% confidence interval of (2.48, 3.32) . This means:

Select the correct option

- ☐ None of these
- ☐ We are sure the true mean yield of this new variety is between 2.48 and 3.32.
- ☐ We are 95% confident that the true mean yield of this variety is 2.9
- ☒ We are 95% confident that the true mean yield of this variety is between 2.48 and 3.32

You have 100% correct answers for this question.



4G

10:19 PM

4G 63%



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MC210203829: ZAIB UN NISA

Time Left: 75 min

STAT301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 1 of 10 (Start time: 10:19:39 PM, 20 August 2021)

Total Marks: 1

A _____ is a range of numbers inferred from the sample that has a certain probability of including the population parameter over the long run.

Select the correct option

- ☒ Hypothesis
- ☐ Lower limit
- ☐ Confidence interval
- ☐ Probability limit

Click and Drag Answer to Move to Next Question



4G

10:21 PM

4G 63%



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MC210203829: ZAIB UN NISA

Time Left: 76 min 00

STA301 Quiz 1

Quiz Start Time: 10:16 PM, 20 August 2021

Question # 2 of 10 (Start Time: 10:21:16 PM, 20 August 2021)

Total Marks: 1

To determine a sample size which test we use

Select the correct option

- ☐ t
- ☐ F
- ☒ None of these
- ☐ z

Click and Drag Answer to Answered Questions



4G

10:22 PM

4G 63%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 82 min

STAT301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 3 of 10 (Start time: 10:22:05 PM, 20 August 2021)

Total Marks: 1

A statistic whose standard error decreases with an increase in the sample size will be

Select the correct option

- ☐ Consistant 
- ☐ Unbiased
- ☐ Efficient
- ☐ None

Click and Drag Answer to Answered Questions



4G

10:23 PM

4G 63%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 82 min(s)

STAT01 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 4 of 10 (Start time: 10:22:57 PM, 20 August 2021)

Total Marks: 1

A deserving player was not selected in the cricket team. It is an example of:

Select the correct option

- ☐ Type-III error
- ☒ Type-I error
- ☐ Type-IV error
- ☐ Type-II error

Click and Drag Answer to Move to Next Question



4G

10:26 PM

4G 62%



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Time Left: 05:00

STAT301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 8 of 10 (Start time: 10:26:42 PM, 20 August 2021)

Total Marks: 1

In a Geometric distribution, Maximum Likelihood Estimator (MLE) for proportion (P) is equal to:

Select the correct option:

- ☐ Sample variance
- ☒ Reciprocal of the mean
- ☐ Reciprocal of the sample variance
- ☐ Sample mean

Click and Drag Answer to Marked Best Question



4G

10:29 PM

4G 61%



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MC210203829: ZAIB UN NISA

Time Left: 87 min(s)

STA301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2023

Question # 19 of 16 (Start time: 10:28:59 PM, 20 August 2023)

Total Marks: 1

The precision of an estimator can be increased by decreasing the;

Select the correct option

- ☒ Level of significance
- ☐ Number of estimators
- ☐ Number of parameters
- ☐ Size of sample

Click and Drag Answer to Answered Questions



4G

10:26 PM

4G 62%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 85 min

STAT01 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 8 of 10 (Start time: 10:26:42 PM, 20 August 2021)

Total Marks: 1

In a Geometric distribution, Maximum Likelihood Estimator (MLE) for proportion (P) is equal to:

Select the correct option:

- ☐ Sample variance
- ☒ Reciprocal of the mean
- ☐ Reciprocal of the sample variance
- ☐ Sample mean

Click and Drag Answer to Move to Next Question



4G

10:25 PM

4G 62%

Quiz
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MC210203829: ZAIB UN NISA

Time Left: 88 min(s)

STAT01 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 7 of 10 (Start Time: 10:25:24 PM, 20 August 2021)

Total Marks: 1

An experiment was conducted to estimate the mean yield of a new variety of wheat. A sample of 20 plots gave a mean yield of 2.9, and a 95% confidence interval of (2.48, 3.32) . This means:

Select the correct option

- ☐ None of these
- ☐ We are sure the true mean yield of this new variety is between 2.48 and 3.32.
- ☐ We are 95% confident that the true mean yield of this variety is 2.9
- ☒ We are 95% confident that the true mean yield of this variety is between 2.48 and 3.32

You have 100% correct answers for this question.



4G

10:29 PM

4G 61%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 87 min(s)

STA301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2023

Question # 19 of 16 (Start time: 10:28:59 PM, 20 August 2023)

Total Marks: 1

The precision of an estimator can be increased by decreasing the;

Select the correct option

- ☒ Level of significance
- ☐ Number of estimators
- ☐ Number of parameters
- ☐ Size of sample

Click and Drag Answer to Move to Next Question



4G

10:28 PM

4G 61%



Quiz
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MC210203829: ZAIB UN NISA

Time Left: 05:00

STAT301 Quiz 1

Quiz Start Time: 10:19 PM, 20 August 2021

Question # 9 of 10 (Start time: 10:28:12 PM, 20 August 2021)

Total Marks: 1

Conventionally, the probability of making a type-II error is denoted by:

Select the correct option

- ☒ β (beta)
- ☐ θ (theta)
- ☐ α (alpha)
- ☐ σ (sigma)

Click and Drag Answer to Marked Best Option



4G

10:28 PM

4G 61%



Quiz
quiz.vu.edu.pk



MC210203829: ZAIB UN NISA

Time Left: 05:00

STA301 Quiz 1

Quiz Start Time: 10:16 PM, 20 August 2021

Question # 9 of 10 (Start Time: 10:28:12 PM, 20 August 2021)

Total Marks: 1

Conventionally, the probability of making a type-II error is denoted by:

Select the correct option

- ☒ β (beta)
- ☐ θ (theta)
- ☐ α (alpha)
- ☐ σ (sigma)

Click and Drag Answer to Marked Question





Question # 9 of 10 (Start time: 07:55:13 AM, 21 August 2021)

Total N/Avg. /

A statistic whose standard error decreases with an increase in the sample size will be

Select the correct action:

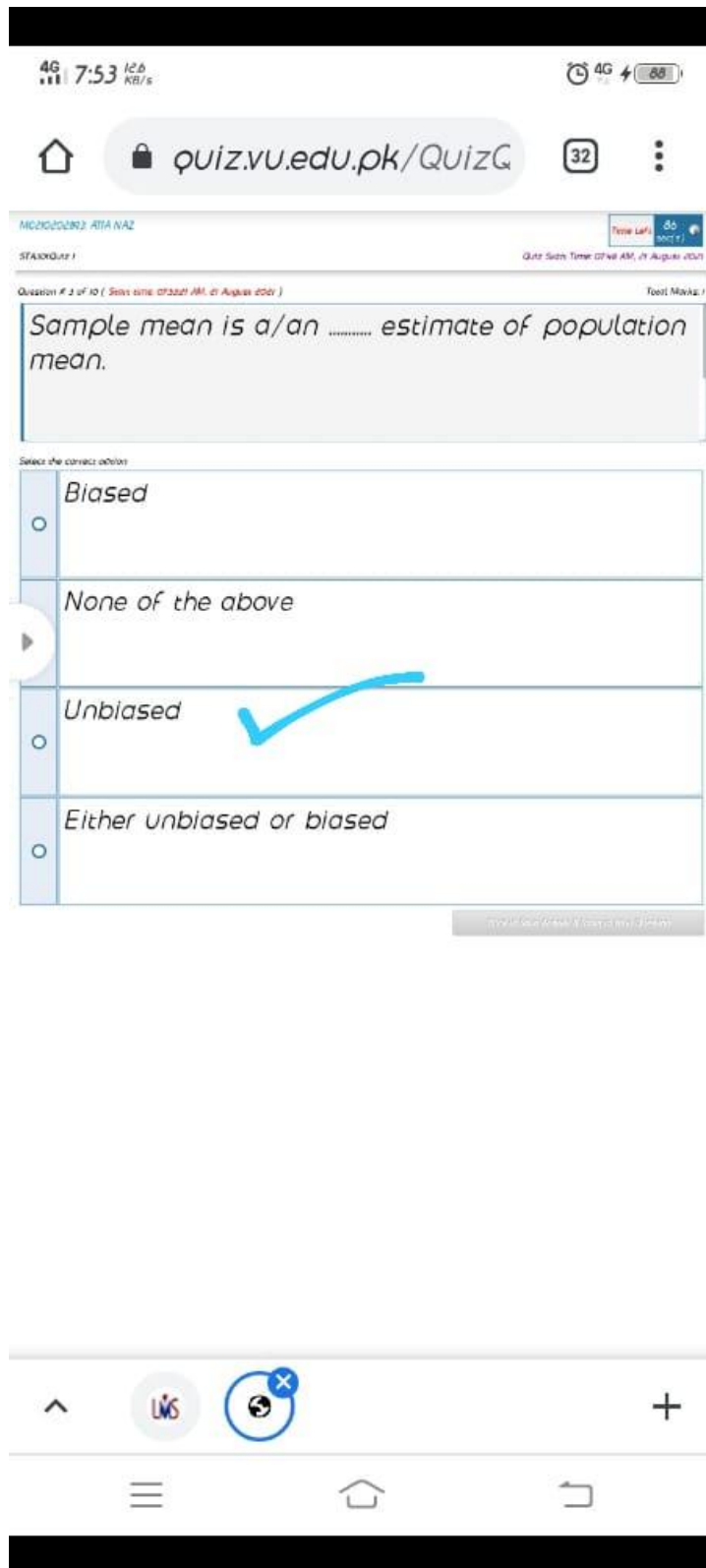
Efficient

None

Unbiased

Consistant





Footi Marka: /

☒	$n > 30$
☐	$n > 50$
☐	$n > 40$
☐	$n > 25$

Question # 3 of 10 (Start time: 07:42:11 PM, 21 August 2021)

Total Marks: 1

How can we interpret the 90% confidence interval for the mean of the normal population.

Select the correct option

- ☐ There are 100% chances of falling true value of the parameter
- ☒ There are 90% chances of falling true value of the parameter
- ☐ All are correct
- ☐ There are 10% chances of falling true value of the parameter

Question # 9 of 10 | Question ID: 1050007 | 10/11/2020 10:00:00 AM

Test Marks: 1

In testing $H_0: \mu = 100$ against $H_1: \mu \leq 100$ at the 10% level of significance, H_0 is rejected if:

▶ The correct answer is

- ☐ The p -value is greater than 0.10
- ☐ The p -value is less than 0.10
- ☐ 100 is contained in the 90% confidence interval
- ☒ The value of the test statistic is in the acceptance region

STA301: Quiz 1

Question # 1 of 10 (Start time: 02:54:02 PM, 21 August 2021)

In the method of moments, how many equations are required for finding two unknown

Select the correct option



2



4



1



3

Type here to search

Question # 10 of 10 (Start time: 02:48:14 PM, 21 August 2021)

To determine a sample size in estimating population mean, we use the ____ value.

Select the correct option

- | | |
|----------------------------------|---|
| ☐ | x |
| ☐ | z |
| ☐ | f |
| ☒ | t |

Type here to search

Question # 5 of 10 ([Skip time 07:57:46 AM, 21 August 2021](#))

Total Marks:

The method of Maximum Likelihood (ML) is used to find out:

▶ the correct option

- ☐ Random numbers
- ☐ Sample values
- ☒ Point estimates ✓
- ☐ Correlation coefficient

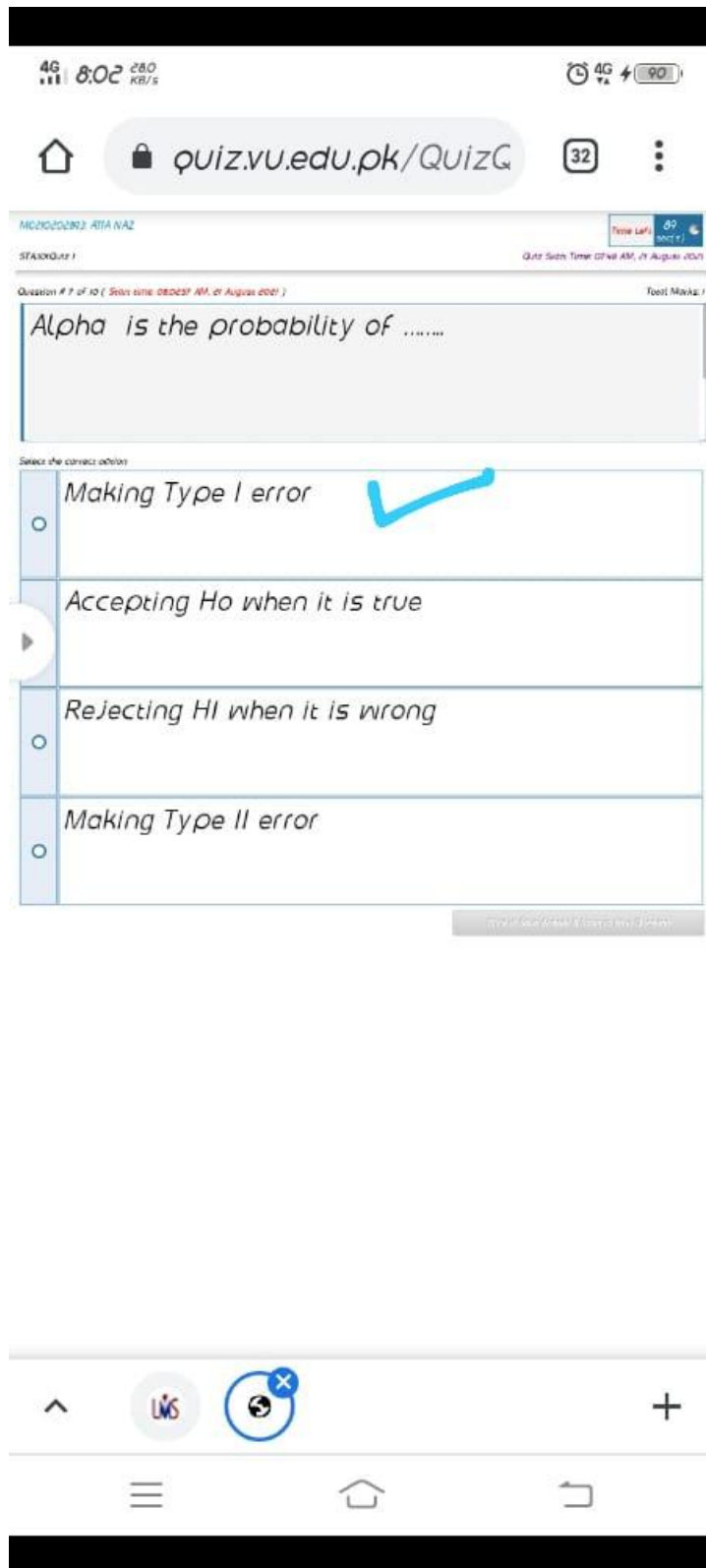
Question # 6 of 10 (Short form: 02:45:20 PM, 21 August 2021)

An estimator is said to be _____ if its expected value is equal to true value of the parameter

Select the correct option

- ☐ Efficient
- ☐ Biased
- ☐ Unbiased
- ☒ Consistent

✓ unbiased



Question # 9 of 10 (Start time: 02:47:37 PM, 21 August 2021)

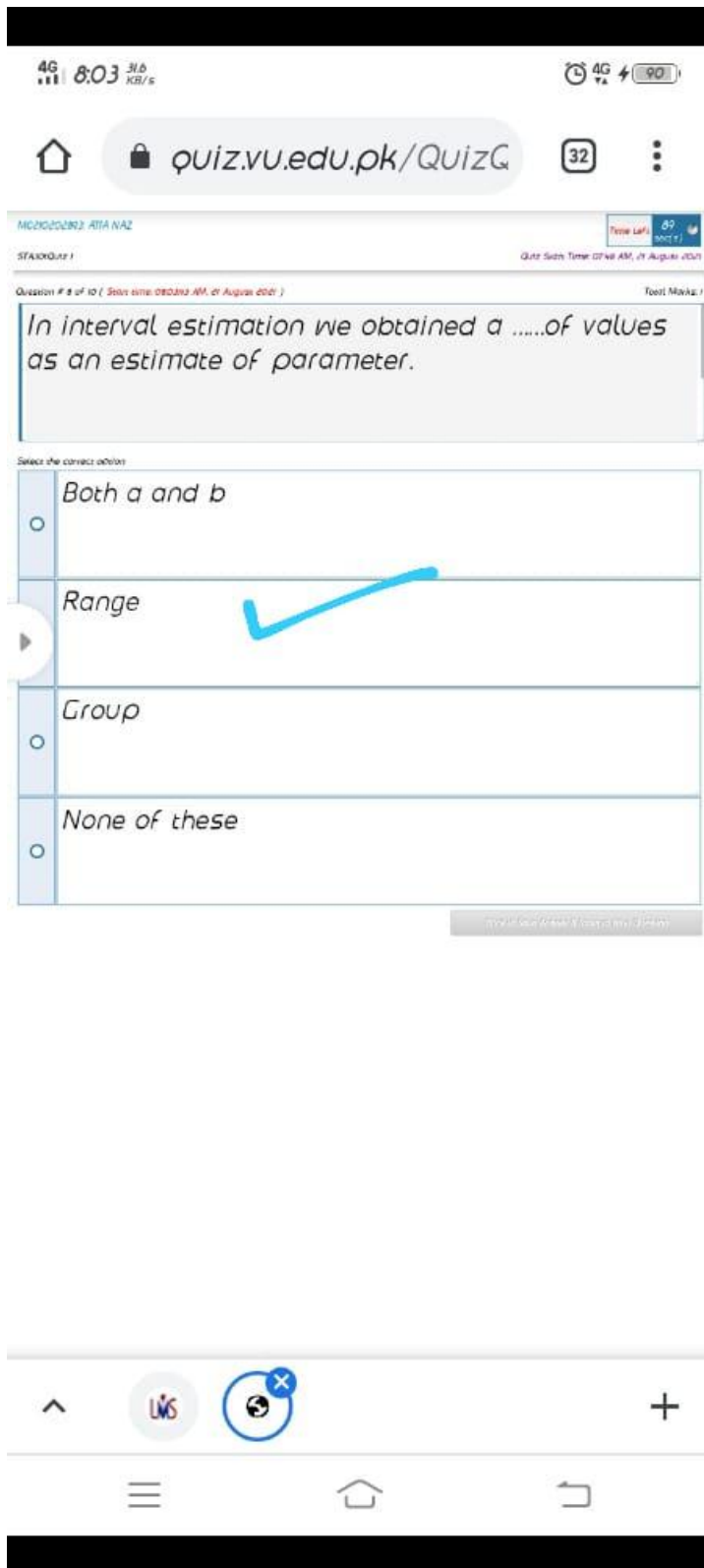
β is the probability of:

Select the correct option

- ☐ Accept H_0/H_0 is true
- ☒ Reject H_0/H_0 is true
- ☐ Accept H_0/H_0 is false
- ☐ Reject H_0/H_0 is false



Type here to search





Question # 10 of 10 (Start time: 01:55:03 PM, 21 August 2021)

We can apply method of Maximum Likelihood on:

▶ correct option

☐ Qualitative variables only

☐ Discrete variables only

☒ Discrete as well as continuous variables



☐ Continuous variables only

Go to Correct Answer & Move to Next Question



Inferential statistics involves:



Select the correct option



Testing of hypothesis



All of these



Confidence interval



Estimation



Finding maximum likelihood estimators is a bit *advanced*, and involves the concept of the Likelihood Function.

RATIONALE OF THE METHOD OF MAXIMUM LIKELIHOOD (ML)

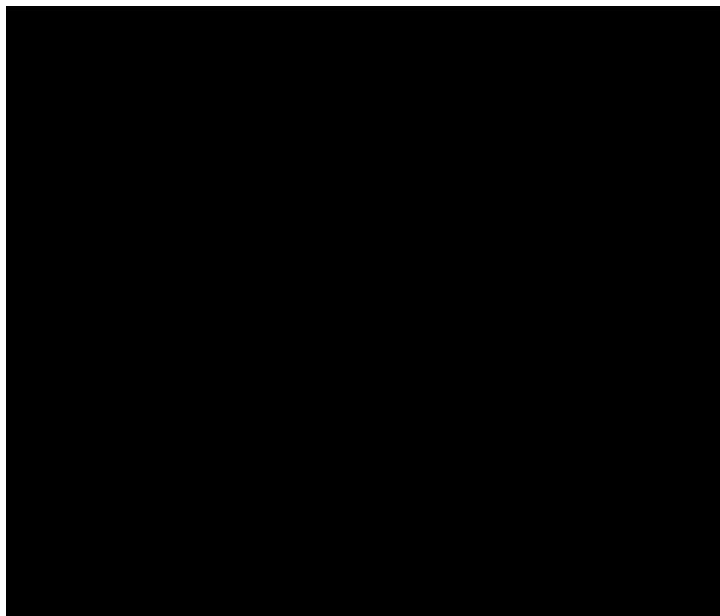
"To consider *every* possible value that the parameter might have, and for *each* value, compute the *probability* that the given sample would have occurred if that *were* the true value of the parameter. That value of the parameter for which the probability of a given sample is *greatest*, is chosen as an estimate." An estimate obtained by this method is called the maximum likelihood estimate (MLE). It should be noted that the method of maximum likelihood is applicable to *both* discrete and continuous random variables.

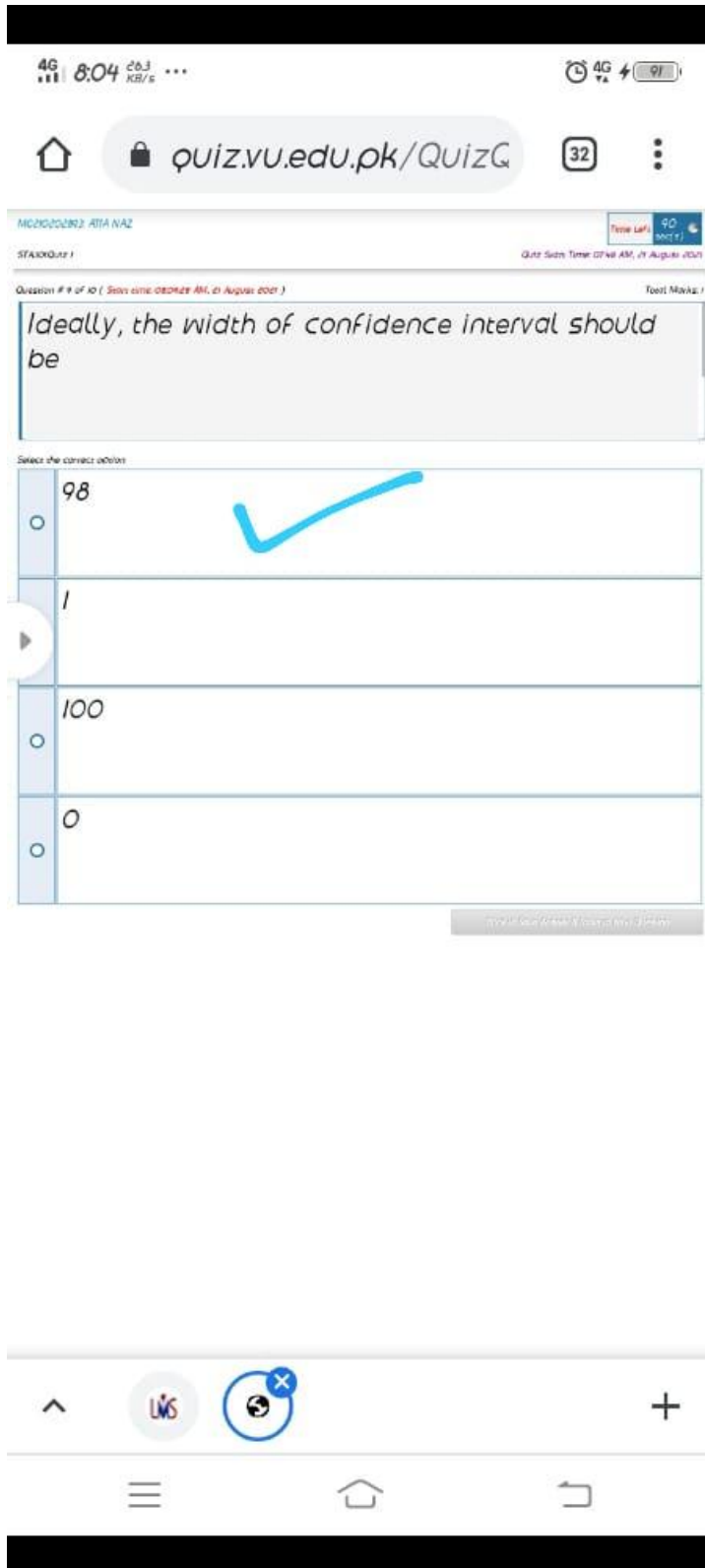
EXAMPLES OF MLE'S IN CASE OF DISCRETE DISTRIBUTIONS

Example-1:

For the Poisson distribution given by

$$P(X=x) = \frac{e^{-\mu} \mu^x}{x!}, \quad x = 0, 1, 2, \dots,$$

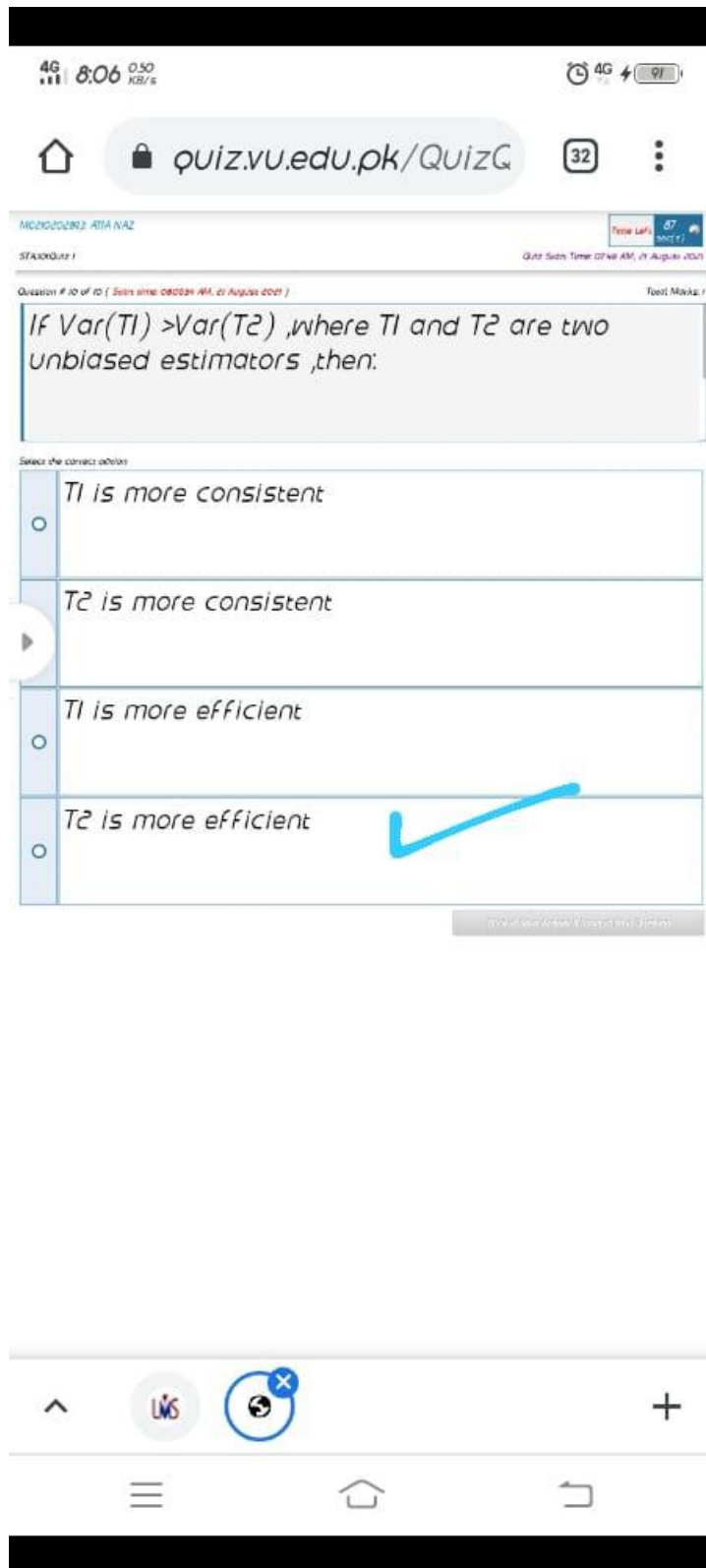




Sample Proportion is a /an_____ estimator of population mean.

the correct option

- ☐ Consistent
- ☒ Unbiased 
- ☐ Unbiased and Consistent estimator
- ☐ None of these



The confidence intervals become wide and less precise by

the correct option



None of these



increasing the sample size



decreasing the level of significance



decreasing the sample size



by increasing the
sample size the
confidence
interval becom
more precise

Click to Save Answer & Move to Next Question

From which of the following methods we can obtain point estimate of the population parameters.

▶ the correct option

☒ All of the above



☐

☐ Maximum Likelihood Method

☐

☐ Method of Moments

☐

☐ Method of Least Squares

☐

A confidence interval has a specified probability _____ of containing the true value of the parameter.

Select the correct option

☒	$1-\alpha$
☐	$\alpha/2$
☐	α
☐	$1+\alpha$

_____ are equivalent.

the correct option

☐ Type-II error and Level of confidence

☒ Type-I error and Level of significance

☐ Type-II error and Level of significance

☐ Type-I error and Level of confidence

Question # 7 of 10 (Start time: 01:33:27 PM, 21 August 2021)

Total Marks: 1

In a Geometric distribution, Maximum Likelihood Estimator (MLE) for proportion (P) is equal to:

Select the correct option

☐	Sample variance
☐	Sample mean
☐	Reciprocal of the sample variance
☐	Reciprocal of the mean



Question # 3 of 10 (Start time: 01:27:41 PM, 21 August 2021)

Total Marks: 1

The Maximum Likelihood Estimators (MLE) are
and but not necessarily

Select the correct option

☐	Consistent, efficient, unbiased	
☐	Consistent, unbiased, efficient	
☐	Unbiased, efficient, consistent	
☐	Unbiased, consistent, efficient	

Interval estimation and Confidence interval are :

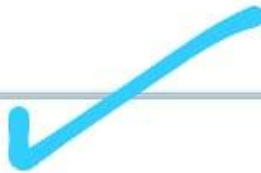
▶ The correct option

☐ Different

☐ Independent

☐ Dependent

☒ Same



"A failed student was passed by the examiner", is an example of:

Select the correct option

☐	Type-I error
☐	Type-IV error
☐	Type-III error
☐	Type-II error



A confidence interval has a specified probability _____ of containing the true value of the parameter.

Select the correct option

- | | |
|----------------------------------|------------|
| ☐ | α |
| ☐ | $\alpha/2$ |
| ☐ | $1+\alpha$ |
| ☒ | $1-\alpha$ |
- 

When sample size is to be considered large, population standard deviation can be replaced by

the correct option



Sample Variance



Sample Mean

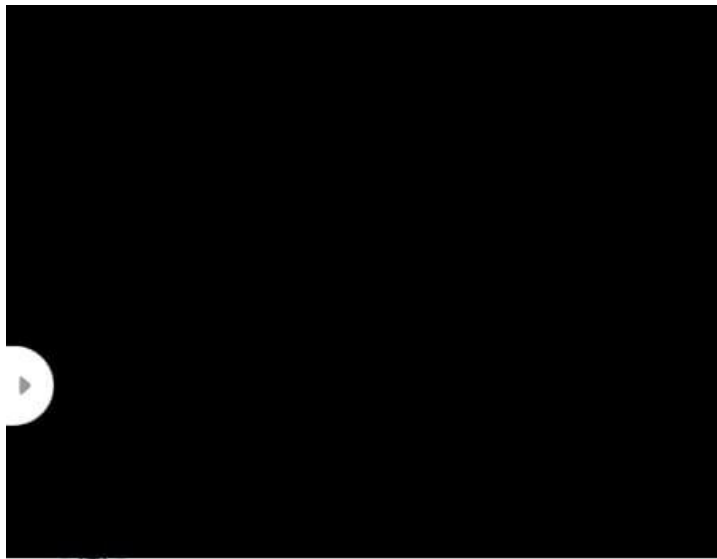


Population variance



Sample Standard Deviation



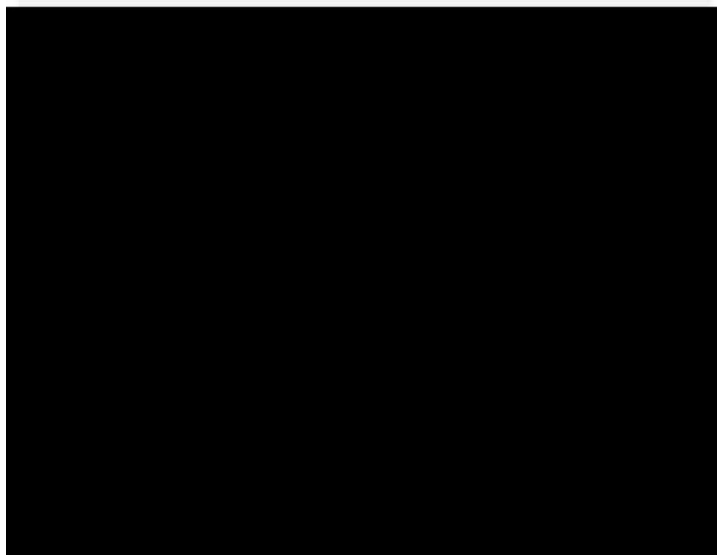


Question 1 of 10 (100%) Correct Answer: $\mu_A > \mu_B$ (Mean A is greater than Mean B)

Suppose that the workers of factory B believe that the average income of the workers of factory A exceeds their average income. the hypothesis will be:

Select the correct option

- | | |
|----------------------------------|----------------------------------|
| ☐ | $\text{MeanA} > \text{MeanB}$ |
| ☐ | $\text{MeanA} \geq \text{MeanB}$ |
| ☐ | $\text{MeanA} < \text{MeanB}$ |
| ☒ | $\text{MeanA} \leq \text{MeanB}$ |



Question # 4 of 10 (Start time: 01:28:18 PM, 21 August 2021)

Total Marks: 1

As sample size goes up, what tends to happen to 95% confidence intervals?

Select the correct option

- | | |
|-----------------------|-------------------------------------|
| ☐ | They become more narrow |
| ☐ | They become more precise and narrow |
| ☐ | They become more precise |
| ☐ | They become wider |
- 



An industrial designer wants to determine the average amount of time it takes an adult to assemble an "easy to assemble" toy. A sample of 16 times yielded an average time of 19.92 minutes, with a population standard deviation equal to 5.73. Assuming normality of assembly times, what is a 95%

confidence interval?

(14.1123, 22.7277)



(17.1123, 24.7277)



(17.1123, 22.7277)



(17.1123, 30.7277)



$$n=16, \bar{x}=19.92, s=5.73$$

$$1-\alpha = 95\% = 0.95$$

$$\alpha = 0.05 \Rightarrow \alpha/2 = 0.025$$

we know that...

$$\bar{x} \pm z_{\alpha/2} \frac{s}{\sqrt{n}}$$

$$19.92 \pm z_{0.025} \frac{5.73}{\sqrt{16}}$$

$$19.92 \pm 1.96 \left(\frac{5.73}{4} \right)$$

$$19.92 \pm 2.8077$$

$$19.92 - 2.8077, 19.92 + 2.8077$$

$$17.1123$$

$$22.7277$$

$$(17.1123, 22.7277)$$