STA301------(Ahmad)

Complete solved paper 2021



Answer (Please select your correct option)

- $P(X = x)$
- $P(X \leq x)$
- $P(X \geq x)$
- $P(X > x)$

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The test statistic used in analysis of variance procedure follow the :

Answer (Please select your correct option)

- χ^2 -distribution.
- T-distribution.
- Z-distribution.
- F-distribution.



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4

Which of the following is true for the Poisson distribution

Answer (Please select your correct option)

- mean > variance
- mean < variance
- mean = variance
- mean= standard deviation

In normal distribution β_1 = ... :

Answer (Please select your correct option)

- 0
- 1
- 2
- 3

Analysis of variance is a procedure that enables us to test the equality of several

Answer (Please select your correct option)

- Variances
- Means
- Proportions
- Groups

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1

Symbolically, a marginal probability is:

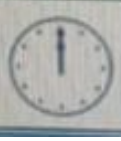
Answer (Please select your correct option)

- P(AB)
- P(A)
- P(A/B)
- P(AUB)



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Answer (Please select your correct option)

- $\frac{\sum(x-\bar{x})^2}{n}$
- $\frac{\sum(x-\bar{x})^2}{n-2}$
- $\frac{\sum(x-\bar{x})^2}{n(n-1)}$
- $\frac{\sum(x-\bar{x})^2}{n-1}$

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Question No : 10 of 40 Marks: 1 (Budg

If $\bar{X}$ is the mean of the n observations, then which test statistic will be used to calculate the confidence limits variance σ^2?

Answer (Please select your correct option)

- Z-statistic
- T-statistic
- χ^2-statistics
- F-statistics

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STA301 Statistics and Probability

Question No : 9 of 40

Marks: 1 (Budgeted Ti

The average height of Pakistani solders exceeds the average height of American solders by not more than 2 inches. T alternative hypothesis H_1 is

Answer (Please select your correct option)

- C $\mu_P - \mu_A = 2"$
- C $\mu_P - \mu_A \geq 2"$
- C $\mu_P - \mu_A > 2"$
- C $\mu_P - \mu_A < 2"$

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Question No : 11 of 40

If mean of χ^2 distribution is k then variance will be:

Answer (Please select your correct option)

- k^2
- 2k
- 1/k
- k

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11

Mean of the F-distribution is possible only, when

Answer (Please select your correct option)

- $v_1 > 2$
- $v_2 > 2$
- $v_1 < 2$
- $v_2 < 2$



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STA301 Statistics and Probability

Question No : 13 of 40

F- distribution is .....

Answer (Please select your correct option)

- Positively skewed
- Negatively skewed
- Normal
- Symmetrical

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TA301 Statistics and Probability

Question No : 16 of 40 **Marks: 1 (Budgeted Time Mi**

Suppose there are 5 treatments with 4 blocks in a randomized completed block design. What are the degrees of freedom fo blocks?

Answer (Please select your correct option)

- 2
- 1
- 3
- 4

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16

Question No : 17 of 40 **Marks: 1 (Budgeted Time Min)**

If there are 8 treatments with 6 blocks in a randomized completed block design then what are the degrees of freedom for treatments?

Answer (Please select your correct option)

- 5
- 4
- 6
- 7



STA301 Statistics and Probability

Question No : 18 of 40

For degree of freedom $\nu \leq 2$ the variance of t-distribution:

Answer (Please select your correct option)

- Is greater than zero
- Is less than one
- Is equal to one
- Does not exist



STA301 Statistics and Probability

Question No : 19 of 40

The parameters of the binomial distribution b(x; n, p) are

Answer (Please select your correct option)

- x & n
- x & p
- n & p
- x, n & p



STA301 Statistics and Probability

Question No : 21 of 40

In a Discrete probability distribution, P (x > 23) is read as:

Answer (Please select your correct option)

- P (there are more than 23 successes)
- P (there are less than 23 successes)
- P (there are at most 23 successes)
- P (there are at least 23 successes)

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Question No : 22 of 40 **Marks: 1 (Budge**

Suppose 'X' is equal to the number of tails, when you throw a coin three times. The possible values of X are:

Answer (Please select your correct option)

- 1,2,3
- 0,1,2,3
- 0,1,2,3,.....
- 1,2,3,.....



Question No : 8 of 40

Marks: 1 (Budg

If the sampling distribution of $\bar{X}$ is normal, we would expect 99% of the sample means to be within the interval

Answer (Please select your correct option)

- $\mu_{\bar{x}} \pm \sigma_{\bar{x}}$
- $\mu_{\bar{x}} \pm 2\sigma_{\bar{x}}$
- $\mu_{\bar{x}} \pm 1.96\sigma_{\bar{x}}$
- $\mu_{\bar{x}} \pm 2.58\sigma_{\bar{x}}$



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Question No : 25 of 40 Marks: 1 (Budgete

A statement about the population parameter (unknown), which may or may not be true , is called

Answer (Please select your correct option)

- Alternative hypothesis
- Test statistics
- Statistical hypothesis
- Null hypothesis



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STA301 Statistics and Probability

Question No : 20 of 40

A statistic is an unbiased estimator of a parameter if

Answer (Please select your correct option)

- E(sample mean)=proportion
- E(statistic)=parameter
- E(mean)=variance
- E(variance)=mean

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Done

If b(x, 5, 0.398), then the variance of this distribution is

Answer (Please select your correct option)

- 1.198
- 3.51
- 1.012
- 3.21

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Done

Question No : 29 of 40

A single number used to estimate an unknown population parameter is

Answer (Please select your correct option)

- An interval estimator
- A point estimator
- An unbiased estimator
- A biased estimator

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A301 Statistics and Probability

uestion No : 30 of 40 **Marks: 1 (B**

The central limit theorem assures us that the sampling distribution of the mean

Answer (Please select your correct option)

- Is always normal
- Approaches normality as sample size increases
- Approaches normality as sample size increases
- Appears normal only when N is greater than 1000

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STA301 Statistics and Probability

Question No : 24 of 40

In a bivarite probability distribution of X and Y, If E(X)=3.2 and E(Y)=3.0, then E(X+Y)= ?

Answer (Please select your correct option)

- 6.2
- 6.8
- 0.2
- 0

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STA301 Statistics and Probability

Question No : 23 of 40

An expected value of a random variable is equal to its

Answer (Please select your correct option)

- Variance
- Standard deviation
- Mean
- Covariance

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STA301 Statistics and Probability

Question No : 22 of 40 **Marks: 1 (Budge**

Suppose "X" is equal to the number of tails, when you throw a coin three times. The possible values of X are:

Answer (Please select your correct option)

- 1,2,3
- 0,1,2,3
- 0,1,2,3,....
- 1,2,3,....

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Done

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STA301 Statistics and Probability

Question No : 40 of 40

Calculate Mean and Variance from the given below sampling distribution of sample Means.

X	P(x)
4	0.2
5	0.4
6	0.3
7	0.1

Answer (Please click here to Add Answer)

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40

y \ x	2	4	$h(y)$
1	0.10	0.15	0.25
3	0.20	0.30	0.50
5	0.10	0.15	0.25
$g(x)$	0.40	0.60	= 1.00

$g(4) = 0.60$

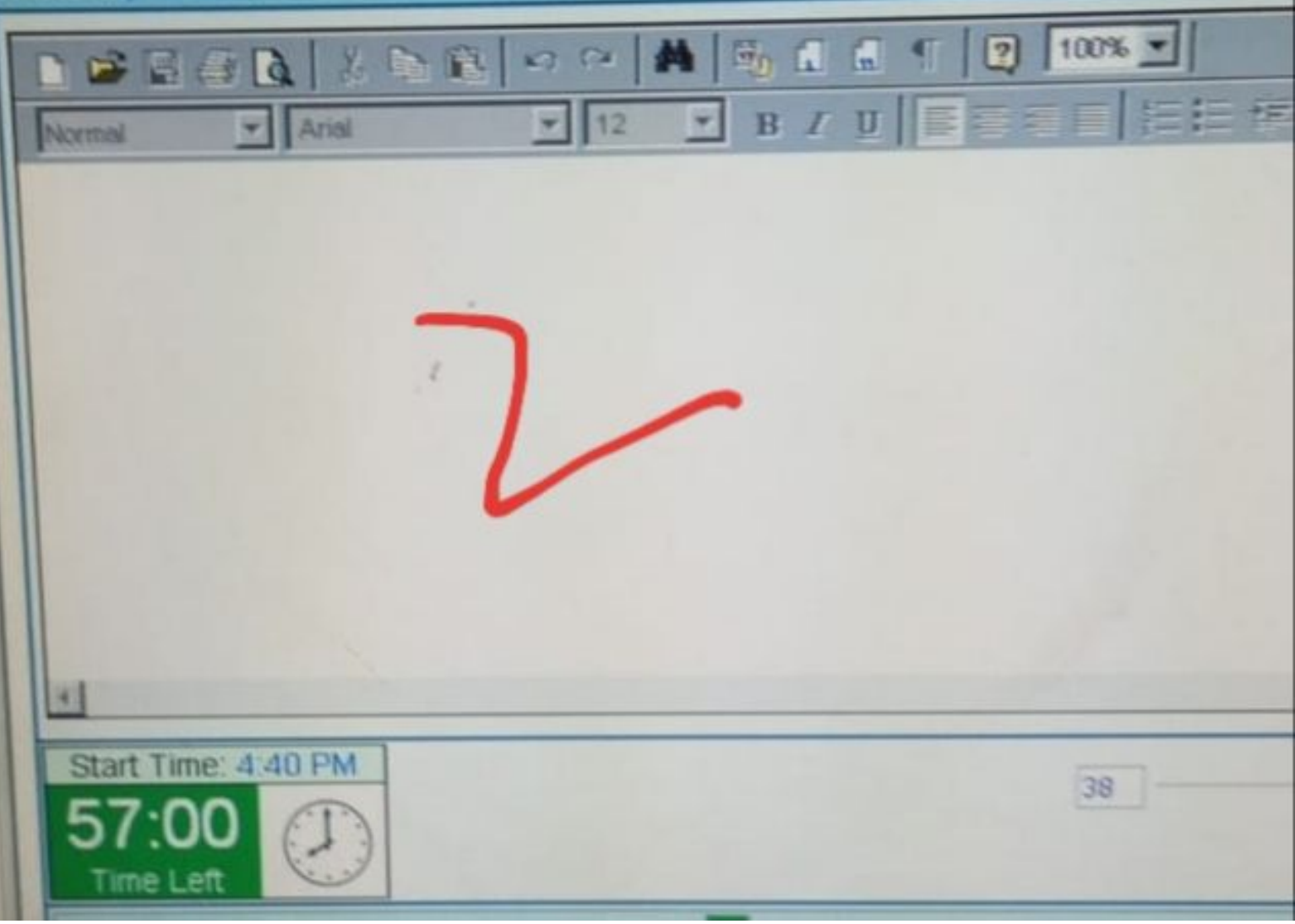
Question No : 38 of 40

For the following probability density function p.d.f,

$$f(x)=\frac{1}{8}x \qquad 0\le x\le 4$$

Calculate the distribution function i.e $F(x)=\int_0^x f(x)dx$.

Answer (Please click here to Add Answer)



$$f(x) = \frac{1}{8}x$$

$$F(x) = \int_0^x f(x)\,dx$$

2

$$= \int_0^4 \frac{1}{8}x\,dx$$

$$= \frac{1}{8}\left|\frac{x^2}{2}\right|_0^4$$

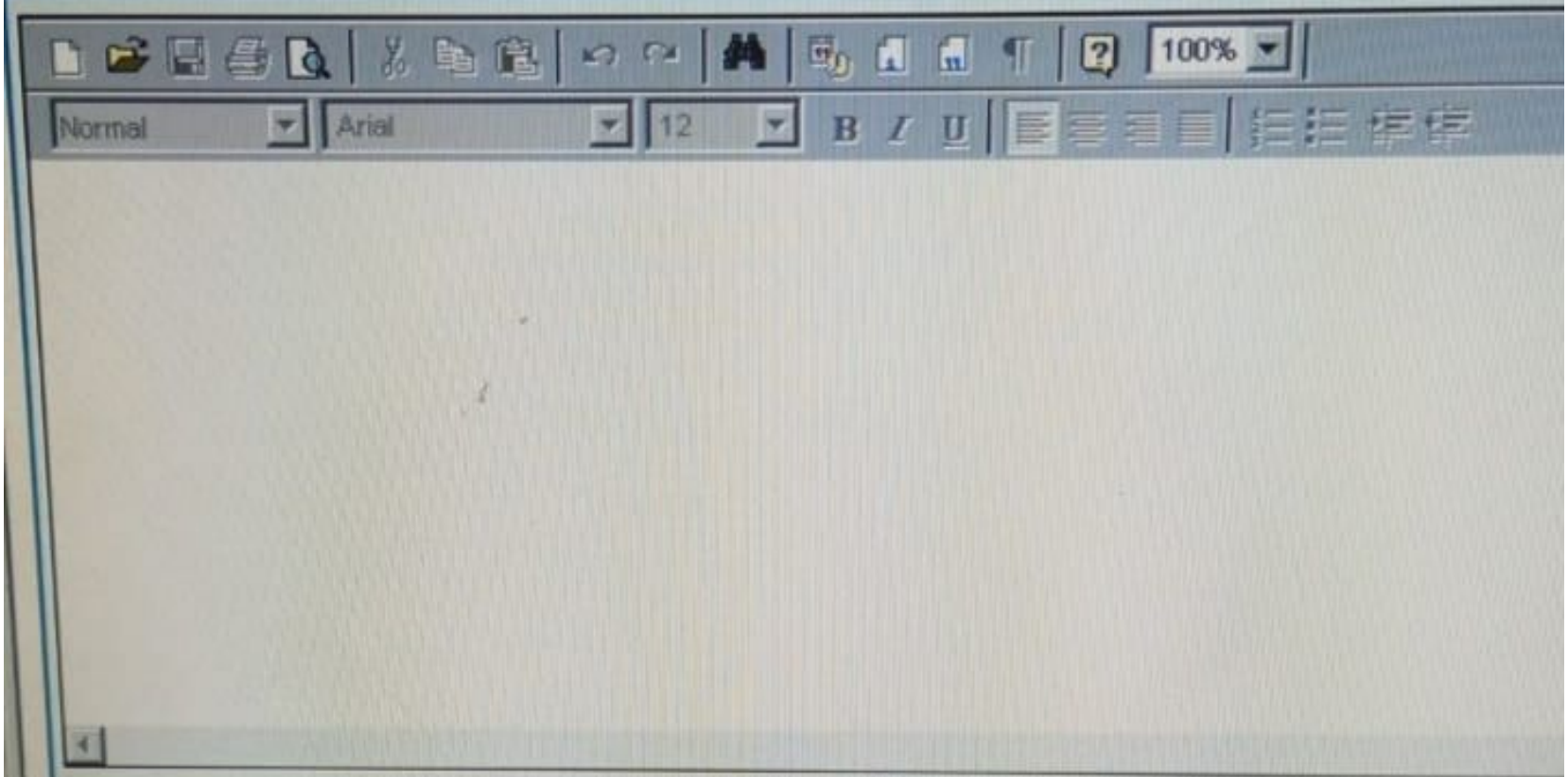
$$= \frac{1}{16}\{(4)^2 - 0^2\}$$

$$= \frac{1}{16}(16) = 1$$

Write down the formula for Hypergrometric distribution.

3

Answer (Please click here to Add Answer)



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PROPERTIES OF THE HYPERGEOMETRIC DISTRIBUTION

- The mean and the hyper geometric probability distribution are

$$\mu = n\frac{k}{N} \text{ and } \sigma^2 = n\frac{k}{N}\frac{N-k}{N}\frac{N-n}{N-1},$$

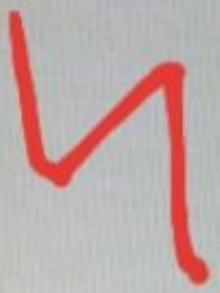
- If N becomes *indefinitely* large, the hyper geometric probability distribution tends to the

Probabil... important points:

TA301 Statistics and Probability

Question No : 34 of 40

Write down the formula for Hypergrometric distribution.



Answer (Please click here to Add Answer)

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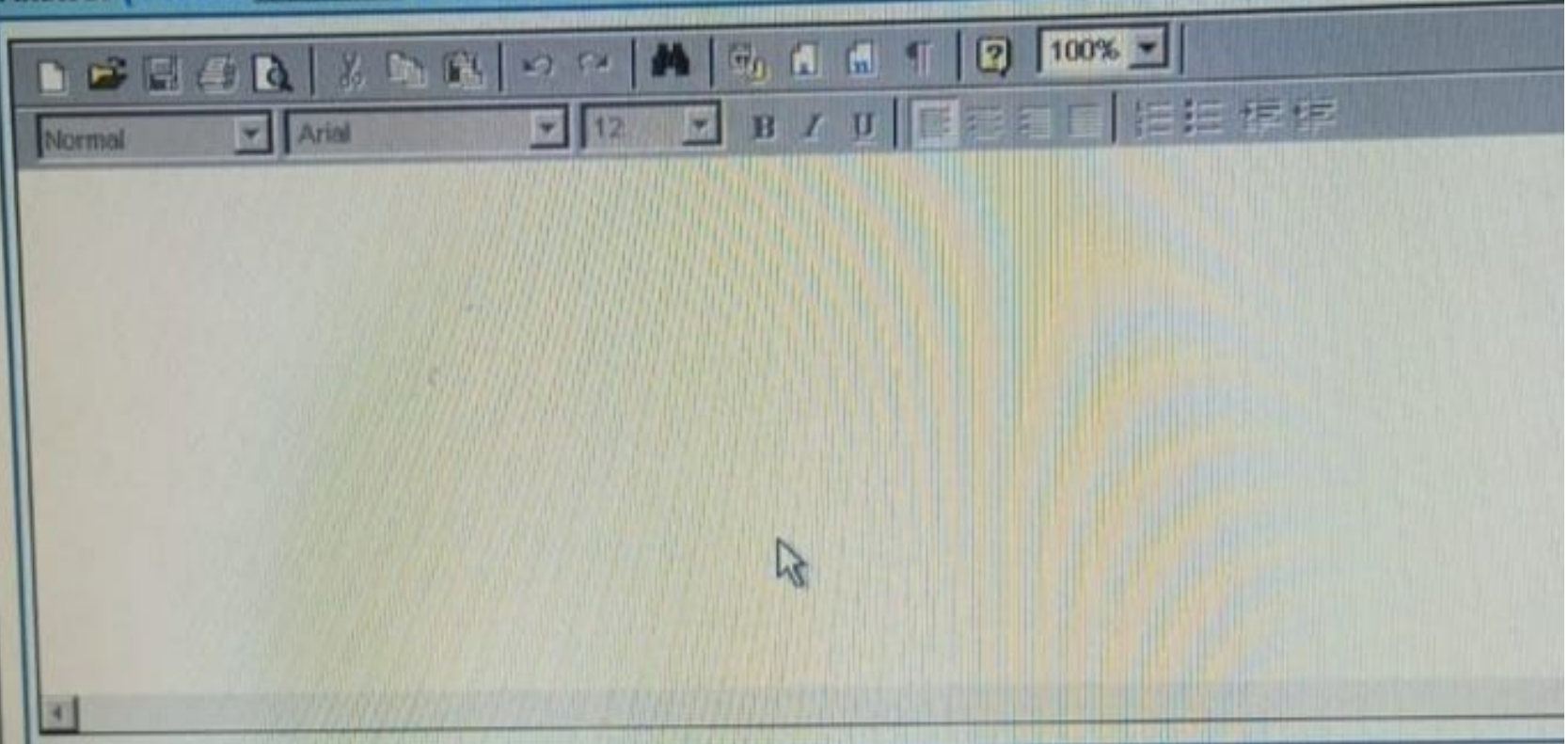
$$P(X = x) = \frac{\binom{k}{x}\binom{N-k}{n-x}}{\binom{N}{n}},$$

Where
N = number of units in the population,
n = number of units in the sample, and
k = number of successes in the population.
The hyper geometric probability distribution has three parameters N, n and k.
The hyper geometric probability distribution is appropriate when



1	0.10	0.15	
3	0.20	0.30	
5	0.10	0.15	
g(x)			

Answer (Please click here to Add Answer)



X	P(X)	XP(X)	$X^2P(X)$
4	0.2	0.8	3.2
5	0.4	2.0	10
6	0.3	1.8	10.8
7	0.1	0.7	4.9
Σ	1.0	5.3	28.9

Mean $= \Sigma XP(X)$

$= 5.3$

variance $= \sigma^2 = \Sigma X^2P(X) - (\Sigma XP(X))^2$

$= 28.9 - (5.3)^2$

$= 28.9 - 28.09 = 0.81$

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STA301 Statistics and Probability

Question No : 33 of 40 **Marks: 2 (Budgeted T**

In a random sample of 1000 houses in a certain city, 618 own colour TV sets. Find the proportion of TV sets.

Answer (Please click here to Add Answer)

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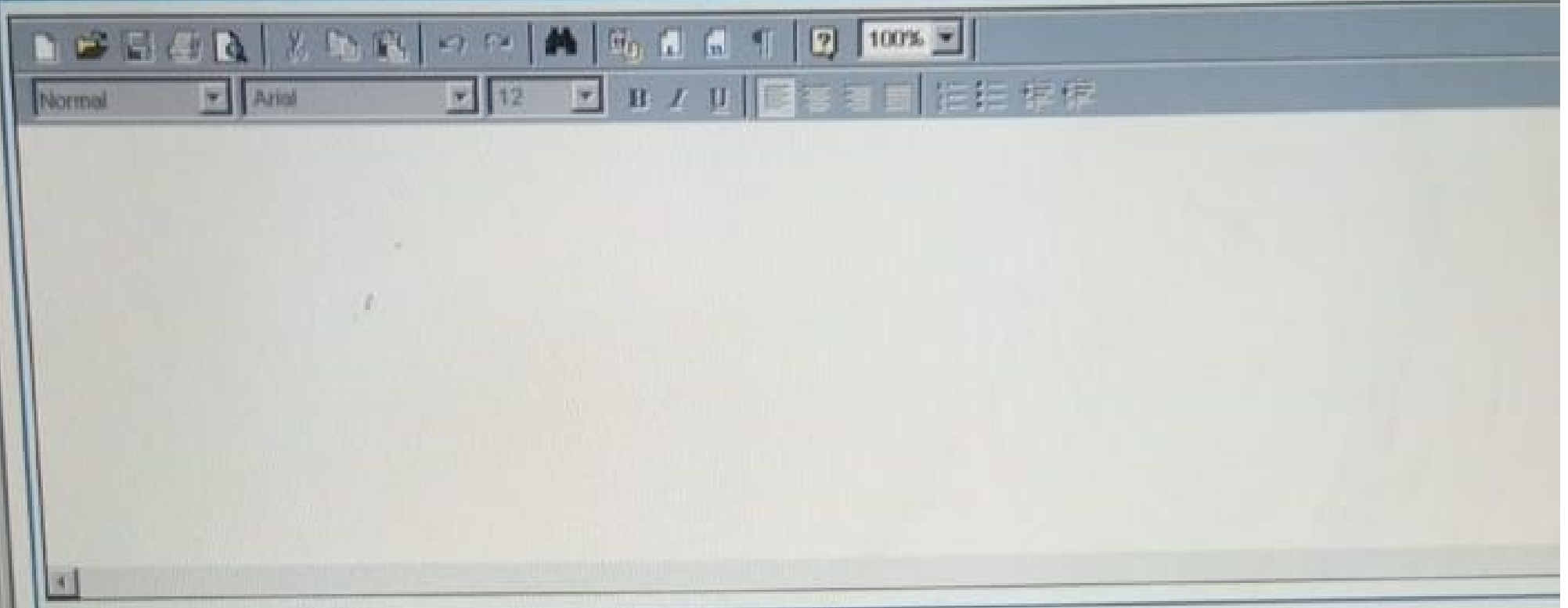
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33

Question No : 37 of 40 **Marks: 3 (Budgeted Time Min)**

In an examination, 36 candidates appeared in Statistics subject. If the probability of passing the subject is 1/4 , find the mean and variance of the distribution.

Answer (Please click here to Add Answer)



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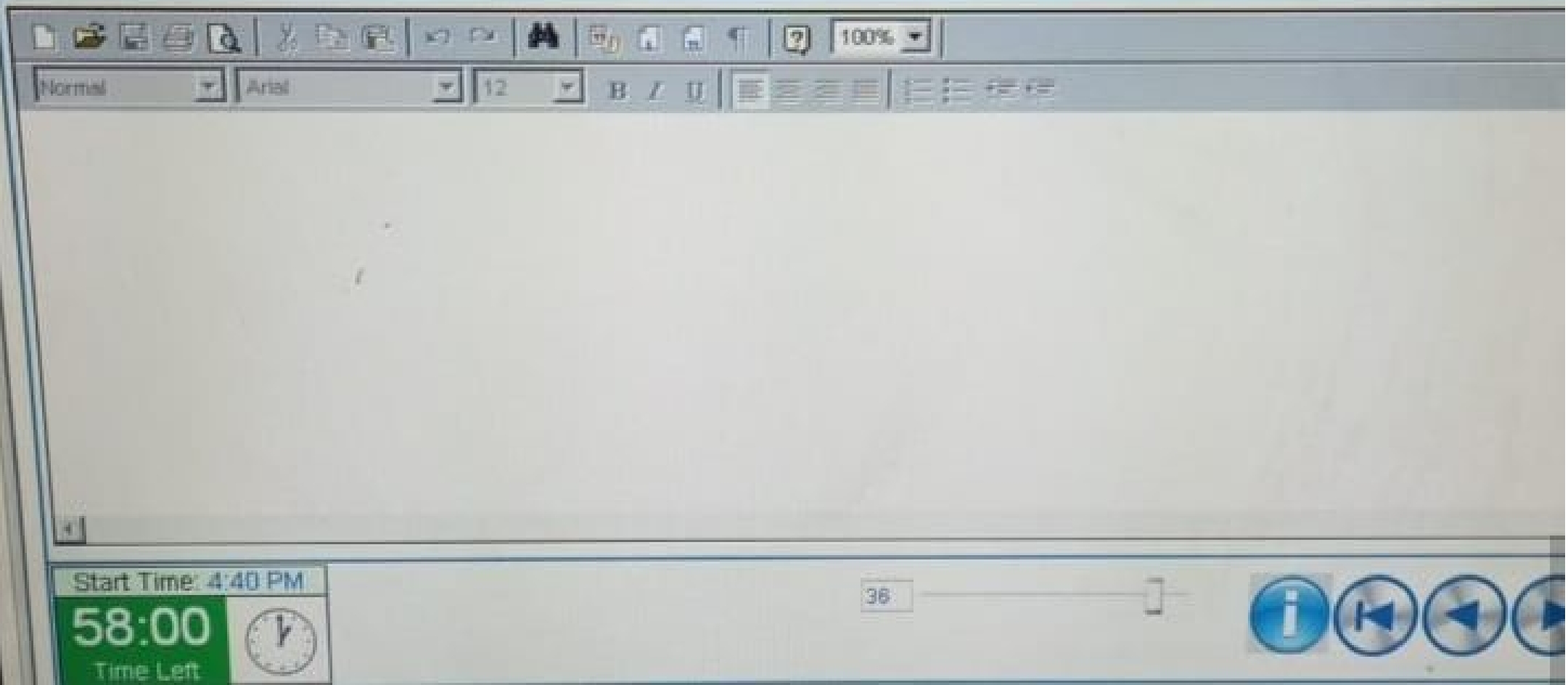
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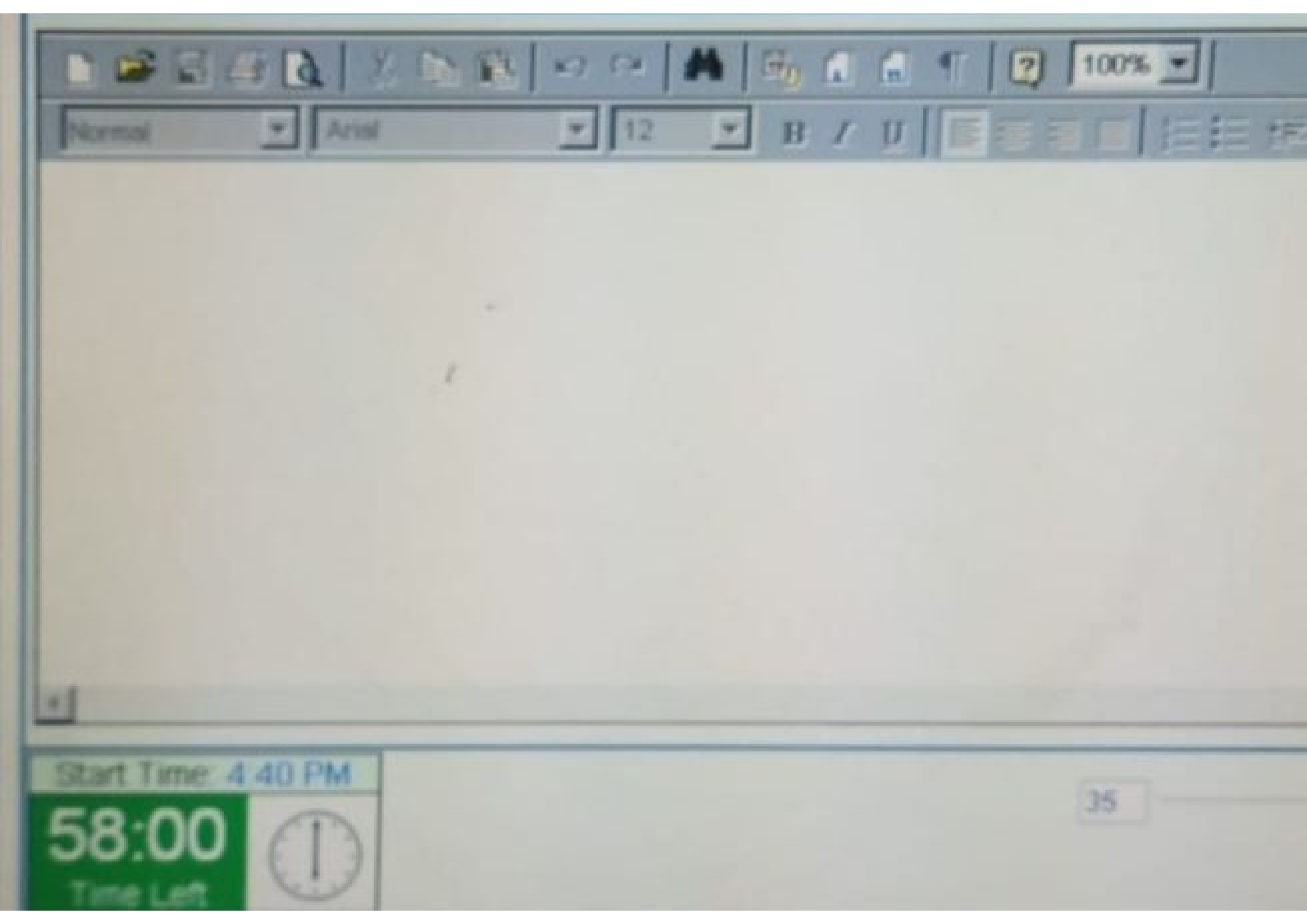
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Question No : 36 of 40 Marks: 3 (Budgeted Time Min)

A random sample of size 25 is drawn from normal population with mean 15 and variance σ^2. If $s = 8$, $\bar{X} = 25$, then compute t-statistic.

Answer (Please click here to Add Answer)

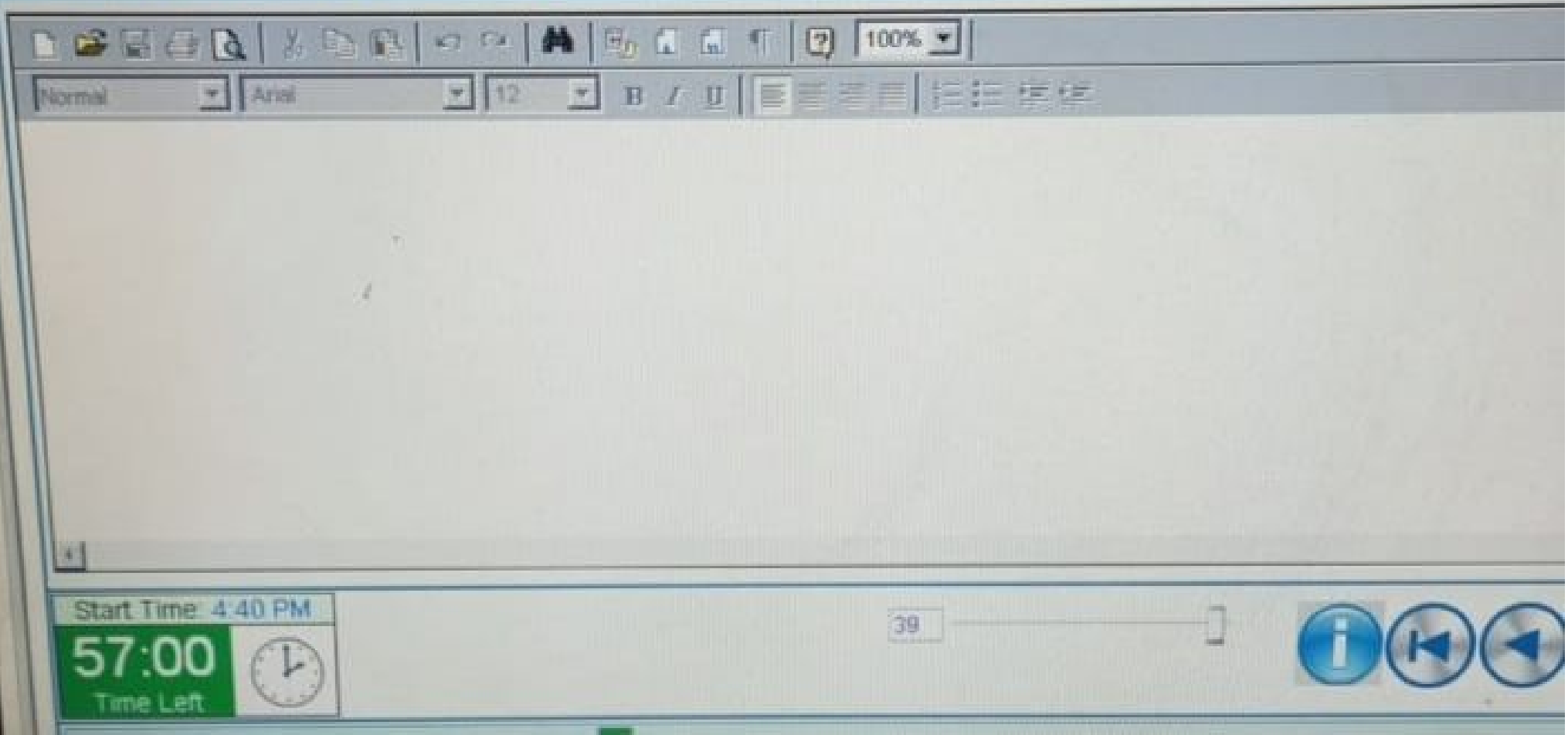



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Question No : 39 of 40 Marks: 5 (Budgeted Time Min)

A random sample of 12 houses is selected and the amount of gas used during the month of July is determined for each house. The resulting observations are 94, 130, 152, 127, 114, 143, 104, 150, 144, 110, 129, 123. Let μ denote the average gas usage during July by all houses in this area. Compute a point estimate of μ.

Answer (Please click here to Add Answer)

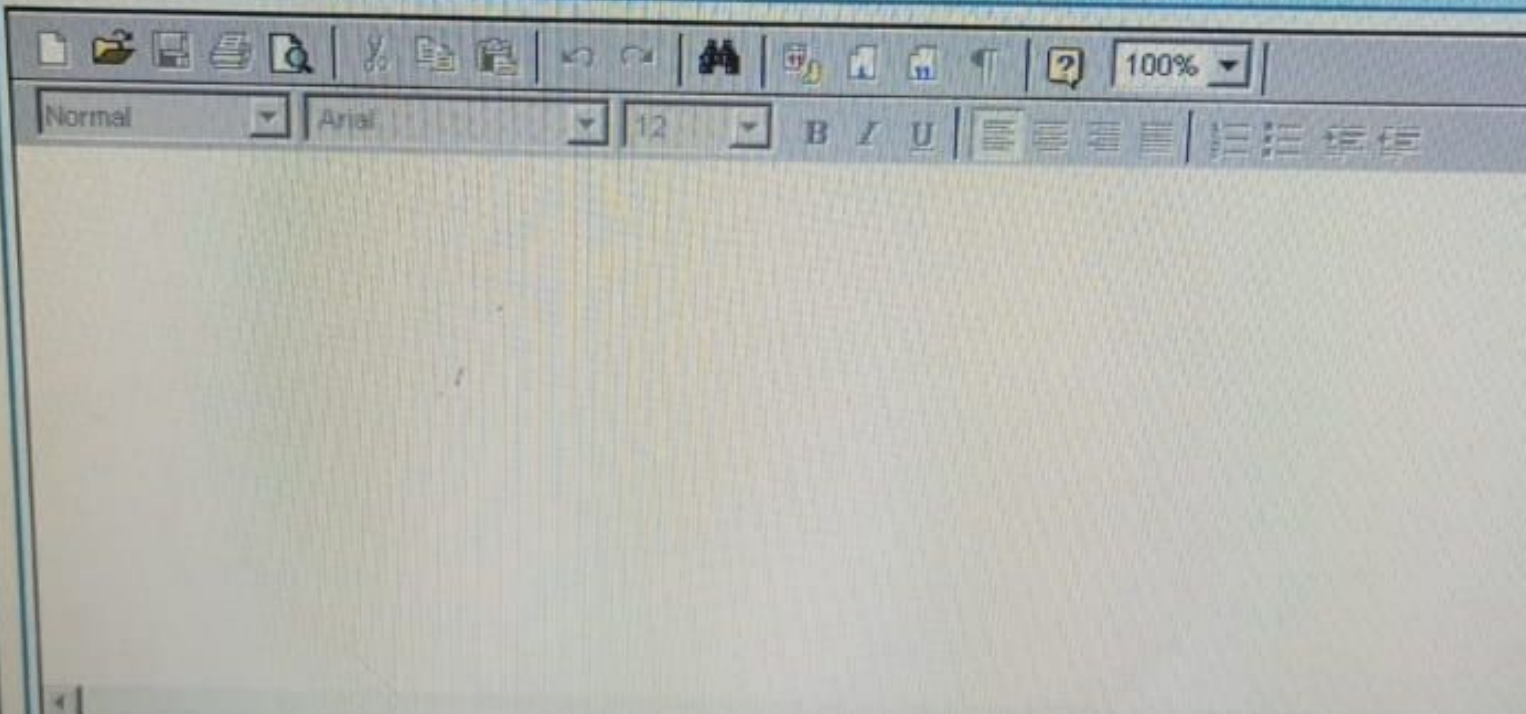


STA301 Statistics and Probability

Question No : 31 of 40

How we decide that the drawn sample is "small sample" or a "large sample"?

Answer (Please click here to Add Answer)



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Question No : 2 of 40

Which of the following is true for the Poisson distribution

Answer (Please select your correct option)

- mean > variance
- mean < variance
- mean = variance
- mean= standard deviation

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