

Koyana Education Society, Patan
Balasaheb Desai College, Patan
Department of Statistics

Activity Report
on

Student Seminar

Koyana Education Society, Patan

Balasaheb Desai College, Patan

Department of Statistics

Date: 12/01/2024

NOTICE

All the students of the department are here by informed that the department of statistics is going to organize Student Seminars on **19/01/2024** and **30/01/2024**. The Schedule of activity is given below. All students are asked to remain present on time.

	Name of the Student	Class	Seminar Topic	Date and Time
1	Kadam Tejaswini Uttam	B.Sc.II	Mode of Normal Distribution	19/01/2024 11:00 a.m. to 12:15 p.m.
2	Kalke Sayali Narayan	B.Sc.II	Test For Population Proportion	
3	More Dhiraj Balu	B.Sc.II	Process control and Product control	
4	Jadhav Karishma Ashok	B.Sc. I	Derivation of formula for Spearman's Rank Correlation Coefficient	30/01/2024 11:00 a.m. to 12:15 p.m.
5	Patil Vinayak Ramchandra	B.Sc. I	Scatter Diagram Method	
6	Sankpal Pratiksha Sopan	B.Sc. I	Demography: Mortality Rates	


(Dr. Supanekar S. R.)

Department of Statistics

DEPARTMENT OF STATISTICS
Balasaheb Desai College, Patan,
Tal. Patan, Dist. Satara

Balasaheb Desai College, Patan

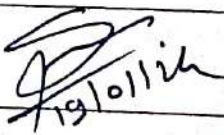
Department of Statistics

Academic Year 2023-2024

Evaluation of Seminar

Name of the Student : Miss. Kadam Tejaswini Uttam
Class : B.Sc. II
Date : 19/01/2024
Topic : Mode of Normal Distribution

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	4
Explanation Skill	3
Communication Skill	2
Black Board Writing	3
Students Participation	3
Total Impression	3 (Good)
Signature of Teacher	 19/01/24

1: Unsatisfactory 2: Satisfactory 3: Good 4: Better 5: Best

Seminar Synopsis

Student Name :-
Kadam Tejaswini Uttam.

Standard :-
B.sc - II

Subject :-
Statistics

Topic :-
Mode of the Normal
distribution.

Introduction :-
We know that mode is
that value of x for which
 $f(x)$ is maximum. i.e roots
of the eqⁿ,

$$f'(x) = 0 \quad \& \quad f''(x) < 0$$

Mode of the Normal
distribution is, μ

// Mode of the Normal distribution :-

If $X \sim N(\mu, \sigma^2)$ then,

$$f(x) = \frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2} \quad -\infty < x < \infty$$

We know that mode is that value of x for which $f(x)$ is maximum.

i.e. roots of the eqⁿ $f'(x) = 0$ & $f''(x) < 0$

Now,

By taking log on both sides, we get

$$\log f(x) = \log\left(\frac{1}{\sigma\sqrt{2\pi}}\right) - \frac{1}{2}\left(\frac{x-\mu}{\sigma}\right)^2$$

Differentiating w.r.t. x , we get

$$\frac{1}{f(x)} f'(x) = 0 - \frac{1}{2} \cdot 2 \left(\frac{x-\mu}{\sigma}\right) \cdot \left(\frac{1}{\sigma}\right)$$

$$\therefore \frac{f'(x)}{f(x)} = -\left(\frac{x-\mu}{\sigma^2}\right)$$

$$\therefore f'(x) = -\frac{x-\mu}{\sigma^2} \cdot f(x) \quad - (1)$$

Now,

$$f'(x) = 0 \Rightarrow -\frac{x-\mu}{\sigma^2} \cdot f(x) = 0$$

$$\therefore \frac{x-\mu}{\sigma^2} = 0$$

$$\therefore x - \mu = 0$$

$$\therefore \boxed{x = \mu}$$

Again differentiating (1) w.r.t. x , we get

$$f''(x) = -\left[\left(\frac{x-\mu}{\sigma^2}\right) \cdot f'(x) + f(x) \left(\frac{1}{\sigma^2}\right)\right]$$

put $x = 11$

$$\therefore f''(x) = 1 - \left[\frac{0 + f(x)}{e^2} \right]$$

$$\leq -\frac{1}{e^2} f(x) < 0$$

$\therefore f''(x) < 0$ for $x = 11$

$\therefore \text{Mode} = 11$

~~Mode = 11~~

$$\frac{(11-x)}{e^2} = \frac{1}{e^2} \Rightarrow (11-x) = 1 \Rightarrow x = 10$$

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Balasaheb Desai College, Patan
Department of Statistics
Academic Year 2023-2024

Evaluation of Seminar

Name of the Student : Miss. Kalke Sayali Narayan
Class : B.Sc-II
Date : 19/01/2024
Topic : Test for population proportions

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	3
Explanation Skill	4
Communication Skill	3
Black Board Writing	4
Students Participation	2
Total Impression	3 (Good)
Signature of Teacher	 19/01/24

1: Unsatisfactory 2: Satisfactory 3: Good 4: Better 5: Best

Seminar Synopsis



Student Name :-

Kalake Sayali Narayan

Class :-

BSC-II

Subject :-

Statistic

Topic :-

Testing of Hypothesis II

Introduction :-

Test for population proportion
($P = P_0$)

* Test for population proportion : ($P = P_0$)

Let $(X_1, X_2, \dots, X_n)$ be a random sample of large size i.e. $n > 30$ drawn from population having a Bernoulli's distribution with parameter P (unknown) i.e. $X_i \sim B(1, P)$. The stepwise test procedure is as follows.

Step I - Null Hypothesis

$$H_0 : P = P_0$$

Step II - Alternative Hypothesis

$$H_a : a) P \neq P_0 \text{ or}$$

$$H_a : b) P < P_0 \text{ or}$$

$$H_a : c) P > P_0$$

Step III - Let the level of significance for this test is α

Step IV - Computation :

$$\text{Sample proportion} = P = \frac{X}{n}$$

$$\text{where, } X = \sum X_i \sim B(n, P)$$

= no. of units in the sample belongs to particular class.

Step V : Test statistic

The test statistic for this test under H_0 ,

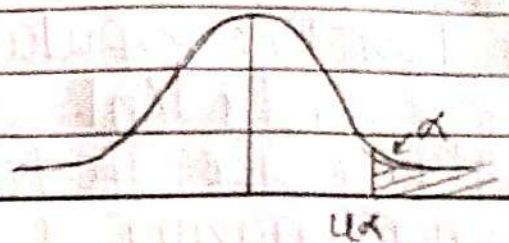
$$U = \frac{P - P_0}{\sqrt{\frac{P_0 Q_0}{n}}} \sim N(0, 1) \text{ for large } n$$

$$Q_0 = 1 - P_0$$

Step VI - Critical Region :

Let U_α be the upper 100α point of standard normal distribution

i.e. $P[U > U_{\alpha}] = \alpha$



We find U_{α} for given α from statistical table. the critical region are as follows.

Alternative Hypothesis	Critical Region
1) $H_1 : \mu \neq \mu_0$	$\{U / U < -\frac{U_{\alpha}}{2} \text{ or } U / U > \frac{U_{\alpha}}{2}\}$
2) $H_1 : \mu < \mu_0$	$\{U / U < -U_{\alpha}\}$
3) $H_1 : \mu > \mu_0$	$\{U / U > U_{\alpha}\}$

Step VII - Decision Rule:

Let U be the value of test statistic. The Decision rule is, reject H_0 if U belongs to Critical Region. otherwise H_0 cannot be rejected.

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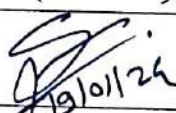
Department of Statistics

Academic Year 2023-2024

Evaluation of Seminar

Name of the Student : Mr. More Shiraj Balu
Class : B.Sc. II
Date : 19/01/2024
Topic : Process Control & product control (S.G.C.)

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	3
Explanation Skill	3
Communication Skill	3
Black Board Writing	3
Students Participation	2
Total Impression	3 (Good)
Signature of Teacher	 19/01/24

1: Unsatisfactory 2: Satisfactory 3: Good 4: Better 5: Best

SEMINAR

SYNOPSIS

Page No.	
Date	

Student Name :-

MORE Dhiraj Balu

Class :-

B.Sc. II

Subject :-

Statistics

Topic :-

Statistical Quality Control

(S.Q.C)

Introduction :-

(S.Q.C) :-

The technique of controlling quality variations with help of statistical methods are known as S.Q.C.

Unit 1.2 :-

Statistical Quality Control (S.Q.C)

1) Process control :-

Process control refers to controlling the quality of product when actual production is going on. Process control detects whether the production process is going on desired fashion in controls quality of goods to be produced. If the machines are turning out the product of required standard achieved largely through the control chart device.

Important points on process control :-

- 1) Quality is achieved through prevention.
- 2) Improve quality by reducing product variations.
- 3) Reduce product cost by decreasing scrap & rework.
- 4) Uniformity at high quality output.
- 5) Using chart tool & online process.

2) Product control :-

Sometimes finished goods, semi-finished goods, raw material or spare parts are purchased by various agencies. It may not be possible to have lot with all goods items. The agencies want to ensure quality of

Product in submitted lots. It is called product control. 100% inspection of lot is not practicable.

Important Points on product control :-

- 1) Quality is achieved through detection method.
- 2) Defective items are removed before shipment to customer.
- 3) No attempts are made to find causes of defective product.
- 4) Production cost is increased.
- 5) Using acceptance sampling plans & offline production process.

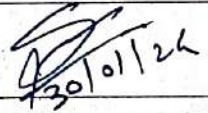
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Evaluation of Seminar

Name of the Student : Miss. Jadhav Karishma Arhole
Class : B.Sc.I
Date : 30/01/2024
Topic : Derivation of formula for
Spearman's Rank Correlation coefficient

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	2
Explanation Skill	3
Communication Skill	3
Black Board Writing	3
Students Participation	3
Total Impression	3 (Good)
Signature of Teacher	 30/01/24

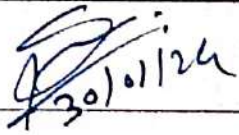
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Evaluation of Seminar

Name of the Student : Mr. Patil Vinayak Ramchandra
Class : B.Sc. I
Date : 30/01/2024
Topic : Scatter diagram method

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	4
Explanation Skill	3
Communication Skill	3
Black Board Writing	3
Students Participation	2
Total Impression	3 (Good)
Signature of Teacher	 30/01/24

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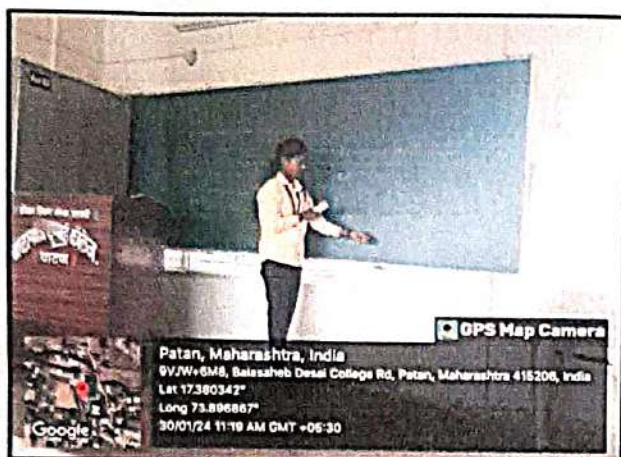
Name of the Student : Miss Sankpal Ratiksha Sopan
Class : B.Sc. I
Date : 30/01/2024
Topic : Demography : Mortality Rates

Evaluation Report

Skill	Marks (out of 5)
Subject Knowledge	4
Explanation Skill	3
Communication Skill	4
Black Board Writing	4
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