ENGINEERING MATHEMATICS

UNIT-5 : *Statistical Techniques – III*

(Testing a Hypothesis and Statistical Quality Control)

Lec-01

Today's Target

- *Basic terms of Hypothesis testing*

  (i) Population

  (ii) Sample

  (iii) Parameter and Statistics

  (iv) Hypothesis: Null Hypothesis and Alternative Hypothesis

  (v) Test of significance

  (vi) Level of significance

ENGINEERING MATHEMATICS

UNIT-5 : Statistical Techniques – III

Aktu Syllabus

Testing a Hypothesis

- Introduction of sampling theory, Hypothesis, Null hypothesis, Alternative Hypothesis, Testing a Hypothesis, Level of Significance, Confidence limit,
- Test of significance of difference of means : (i) t – test (ii) Z – test (iii) Chi-square test 14 Marks

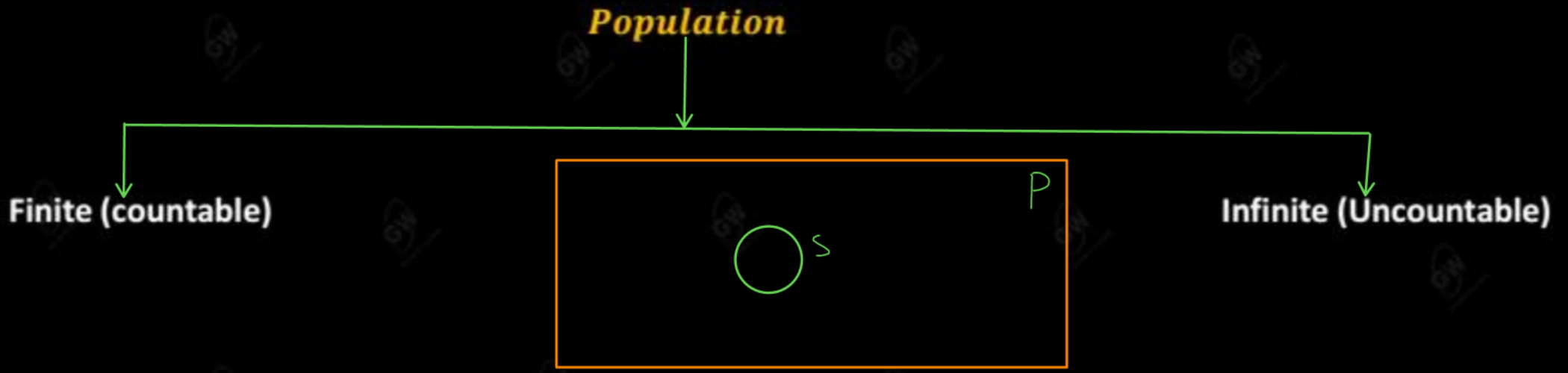
Statistical Quality Control 7 Marks

- Control charts
- Control charts for variables (X and R charts)
- Control charts for variables (p, np and C charts)

Basic terms of Hypothesis testing

(i) Population or Universe:

Any collection of individual | members |objects | set of all experimental data



(ii) SAMPLE : A Finite subset of population

- *To study population, we select a random sample in such a way that each member of population has equal chance to include in sample*
- **Sample Size** : *The number of member | objects |individual in a sample*
- **Sampling** : *Process of selecting a sample*

(iii) Parameter and Statistics: Symbols for Population and Samples

	Parameter	Statistic
S.NO.	Measures used for Population	Measures used for Sample
1	Population Size (N)	Sample Size (n)
2	Population Mean (μ)	Sample Mean $(\bar{x})$
3	Population S. D (σ)	Sample S. D (s)
4	Population Variance (σ^2)	Sample Variance (s^2)
5	PopulationProportion (P)	Sample Proportion (p)

(iv) Hypothesis / Statistical Hypotheses

Hypotheses → Assumptions required to make decisions about population on the basis of sample informatiion

Test of Hypotheses → Deciding a hypotheses is to be accepted or rejected

Null Hypothesis (H_o)

- It is a definite statement about population parameter
- Tested under the assumption that it is true

Alternative Hypotheses (H_1)

It is complementary to the null hypothesis

Note: (1) (H_0) : *Accept* *then* (H_1) : *Reject*

(2) (H_0) : *Reject* *then* (H_1) : *Accept*

Test of significance *(or Null Hypothesis testing)*

The tests which enable us, to decide whether the Null Hypothesis is eccepted or rejected on the basis of sample information

(*i*) t *– test*

(*ii*) Z *– test*

(*iii*) F *– test*

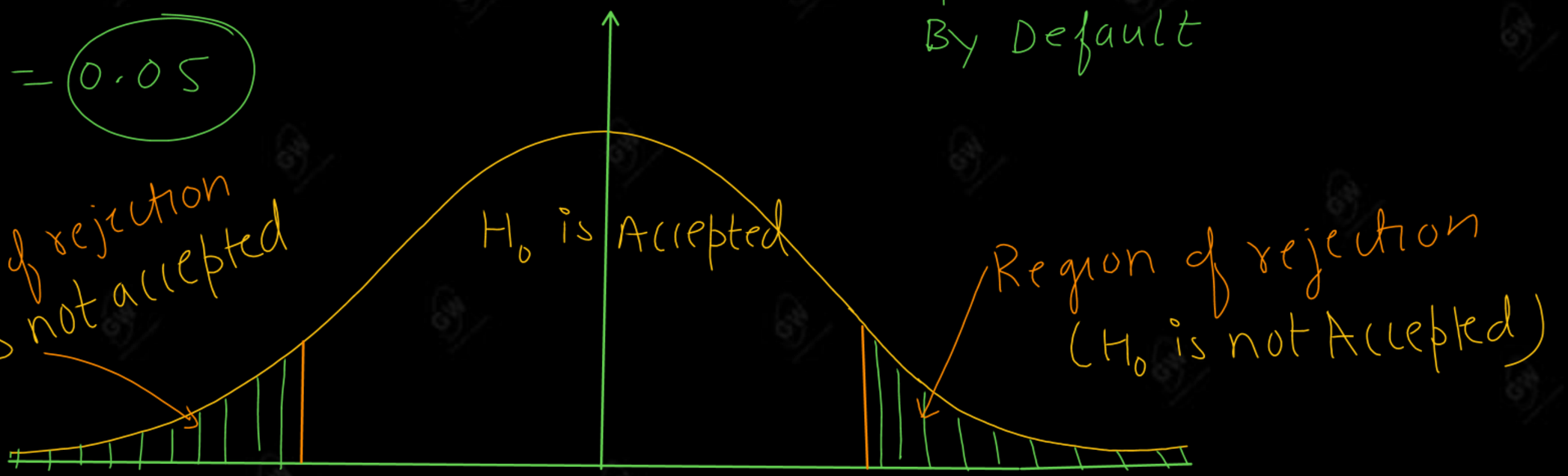
(*iv*) *chi, –square test*

Level of significance ($\propto$)

- The value of probability above which we do not reject the Null Hypothesis.
- Usualiy, level of significance in testing of hypothesis are 5 % , 1%

By Default

$\frac{5}{100} = 0.05$



GATEWAY CLASSES

AKTU Full Courses (Paid)

Download Gateway Classes Application

From Google Play store

All Subjects

Link in Description

Thank You

GATEWAY CLASSES