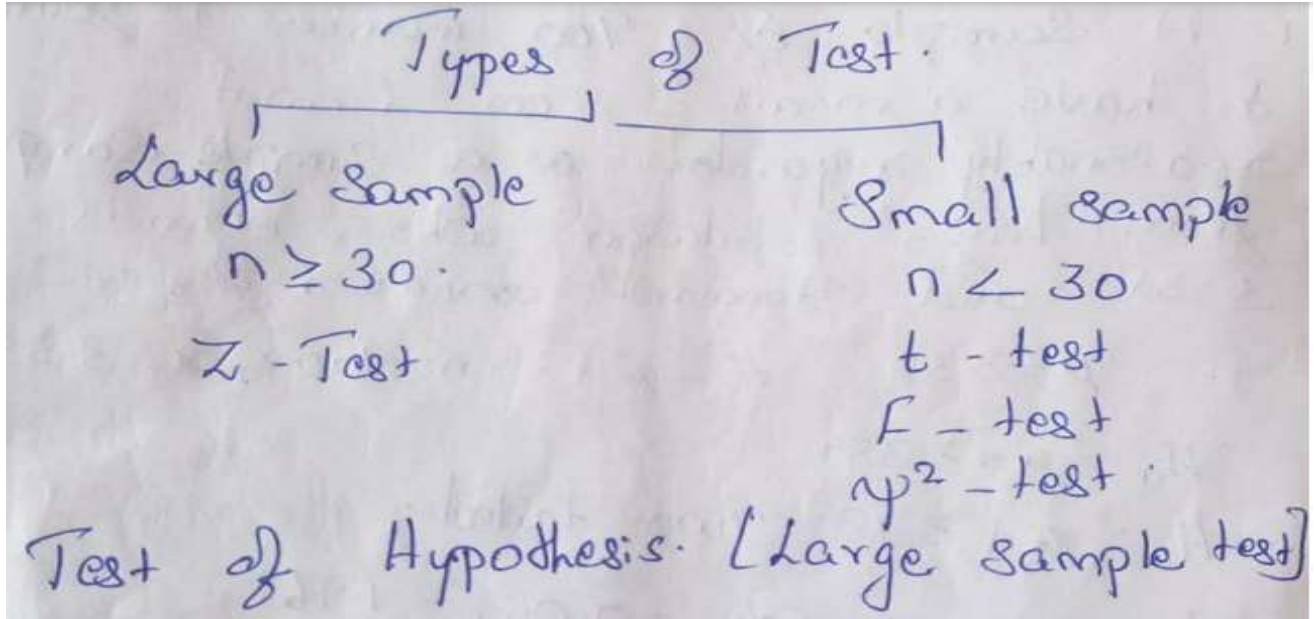




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Topic: 1.2 – Large sample test based on Normal distribution- single mean



Problems:

1. A sample of 900 members is found to have a mean 3.5 cm. Can it reasonably regarded as a simple sample from large population whose mean is 3.38 and standard deviation 2.4 cm?

$\mu = 3.38$ $\sigma = 2.4$ $n = 900$ $\bar{x} = 3.35$

$H_0: \mu = 3.38$
 $H_1: \mu \neq 3.38$ Two tailed.

L.O.S : $\alpha = 5\% = 0.05$ $= 1.96$

Test Statistic.

$$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$
$$= \frac{3.35 - 3.38}{2.4 / \sqrt{900}} = 1.5$$



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Critical value . 7
At 5% Level $Z_{\alpha} = 1.96$.
Conclusion .
 $1.5 < 1.96$.
 $\therefore H_0$ is accepted at 5% level of Significance .

A random sample of 200 Employees at a large corporation showed their average age to be 42.8 years with a S.D of 6.8 yrs. Test the hypothesis $H_0: \mu = 40$ versus $H_1: \mu > 40$ at $\alpha = 0.01$ L.O.S.

$$H_0 : \mu = 40$$

$$H_1 : \mu > 40 \text{ (One tailed Right)}$$

$$\mu = 40, \quad \bar{x} = 42.8, \quad n = 200, \quad \sigma = 6.8$$

$$L.O.S \Rightarrow 1\%$$

Test Statistics

$$Z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}}$$



$$\therefore Z = \frac{42.8 - 40}{\frac{6.8}{\sqrt{200}}} = 5.747$$

Critical value.
At 1% $Z_{\alpha} = 2.33$

Conclusion.
 $5.747 > 2.33$.
 H_0 rejected at 1% level.

3. A sample of 900 members has a mean of 3.4 cms and S.D 2.61 cms. Is the sample from a large population of mean 3.25 cm and S.D. 2.61 cms