Testing of Hypothesis :-

Step 1 :- Seting up of Hypothesis
H_0 & H_1 which are complementary to eachothers

Step 2 :- Compute some stastical value β_{calc}

Step 3 :- Look up tabulated value based on
'δ' α & degree of freedom
β_{tab}

Step 4 :- Compare β_{calc} & β_{tab}

If $\beta_{calc} > \beta_{tab}$

H_0 is rejected

For two tailed test

if $|\beta_{calc}| > \beta_{tab}$

H_0 is rejected.

Random Number Test are divided into two categories

1) Test for Uniformity
   a) KS - Test
   b) Chisquare Test

b 11> Test for independence
a> Auto correlation Test
b> Run Test
c> Gap Test
d Poker Test

Chi-square Test

± Numerical 1 (For discrete short sequence)
3, 7, 17, 9, 47, 8, 67, 94
Test the uniformity of this sequence of random numbers using Chisquare Test with $\alpha = 5\%$.

Soln,
Mean ($\bar{x}$) = 31.5

S_1: H_0 :- The sequence is uniform distributed distribut
H_1 :- The sequence is not uniformly

S_2: $\chi^2_{calc} = \left[\frac{(O_i - E_i)^2}{E_i}\right]^2$ O_i is observed value
E_i is expected value

$= \frac{(3-31.5)^2}{31.5} + \frac{(7-31.5)^2}{31.5} + \cdots$
$\cdots + \frac{(94-31.5)^2}{31.5}$

X^2_{calc} =

S3. $X^2_{tab} = X^2_{\alpha, df}$

Here there are 8 different numbers so degree of freedom is 8

$X^2_{0.05,8} = 15.507$

S4 Compare X^2_{calc} & X^2_{tab}

X^2_{calc} X^2_{tab}

So,