

State the main points of the Central Limit Theorem for a mean.

Ans.

Let  $X_1, X_2, \dots, X_n$  be a sequence of independent and identically distributed (iid) random variables with finite mean  $\mu$  and finite (non-zero) variance  $\sigma^2$  then the distribution of mean follows normal distribution as  $n \rightarrow \infty$ .

i.e.  $\bar{X}$  follows  $N\left(\mu, \frac{\sigma^2}{n}\right) \Rightarrow \frac{\bar{X} - \mu}{\sqrt{\sigma^2/n}}$  follows  $N(0,1)$  as  $n \rightarrow \infty$ .

Thus mean follows normal distribution for large  $n$ .