

CBS course

School of Studies in Statistics

Vikram University, Ujjain

M.A./M.Sc IV sem Statistics

Series configuration: In series configuration all components must be connected in series in order to make the system to perform continuously. In this system all components are considered critical in that sense that their function must be performed in order to make the system to operate successfully. Under this concept if any one component connected in series fails, the system will fail. The reliability block diagram represents the series configuration.

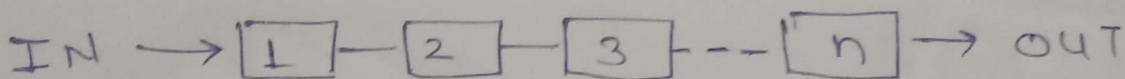


Figure Series configuration

The characteristics of series configuration are

- ★ The components are interconnected in such a way that the entire system will work satisfactorily if all the components work without fail.

* The entire system will fail even if one of its components fails. System Reliability (R_s) can be determined by using component reliabilities.

If each component has a constant failure rate of λ_i , then the system reliability is equal to:

$$R_s(t) = \prod_{i=1}^n R_i(t) = \prod_{i=1}^n [\exp(-\lambda_i \cdot t)] = \exp\left[-\sum_{i=1}^n \lambda_i \cdot t\right]$$
$$= \exp[-\lambda_s \cdot t] \quad \text{where } \lambda_s = \sum_{i=1}^n \lambda_i$$

Teacher: Dr. Ruchi Yadav
Cont : 9993482294.