

## Unit-I

1) (a) Discuss the categories for specifying the performance criterion of a cellular system.

Ans:- There are three categories for specifying performance criteria:-

→ Voice Quality:- For any given commercial communication system, the voice quality will be based upon some following criteria. A set value  $x$  at which  $y$  percent of customers rate the system voice quality (from Transmitter to Receiver) as good or excellent. The top two circuits merits (cm) of the live are listed below

<u>CM</u>	<u>score</u>	<u>Quality scale</u>
CM5	5	Excellent (Perfectly understandable)
CM4	4	Good (some noise)
CM3	3	Fair (Occasional repetitions needed)
CM2	2	Poor
CM1	1	Unsatisfactory

→ As the percentage of customers choosing CM5, CM4 increases the cost of building system rises.

→ The average of the CM scores obtained from all the listeners is called mean opinion score (MOS)  
For quality voice,  $MOS \geq 4$ .

## → Service Quality:-

- Coverage:- The system should serve an area as widely as possible with radio coverage, however due to irregular terrain configuration and for the following reasons, it is usually not practical to cover 100% of the area. The two reasons are:-

- ↳ Transmitted power would have to be very high to illuminate weak spots with sufficient reception, which increases cost.

- ↳ The higher the transmitted power, Harder it becomes to control interference.

Hence, a system usually covers 90% of an area in flat terrain and 75% of an area in hilly terrain.

- Required Grade of Service:- Grade of service is a measure of the ability of a user to access a trunked system during the busiest hour.

- Number of dropped calls:- During 'Q' calls in a hour, if a call is dropped and Q-1 calls are completed, then the call drop rate is  $1/Q$ . The drop rate



must be kept low.

→ Special features:- A system should be able to provide as many special features as possible like

- Call forwarding
- Call waiting
- Voice stored box
- Automatic roaming or Navigation services

However, sometimes, the customers may not be willing to pay extra charges for these special features.