

Sure, here are the definitions and explanations you requested:

**1. Absolute bandwidth** is the total width of a signal's spectrum in hertz (Hz). It is the difference between the highest and lowest frequency components of the signal.

**2. Power efficiency** is a measure of how well a system uses power to transmit a given amount of information. It is typically expressed in bits per joule (b/J).

**3. A linear equalizer** is a device that compensates for the distortion caused by a channel by inverting the channel's frequency response. This allows the signal to be transmitted without distortion. A **non-linear equalizer** is a device that compensates for the distortion caused by a channel by using non-linear operations, such as clipping or limiting. This can be more effective than a linear equalizer for certain types of distortion.

**4. Transmit diversity** is a technique that uses multiple transmit antennas to improve the performance of a wireless system. By transmitting the same signal from multiple antennas, transmit diversity can increase the signal strength at the receiver, reduce the effects of fading, and improve the overall reliability of the link.

**5. Multiple access** is a technique for allowing multiple users to share a single communication channel. There are many different multiple access techniques, each with its own advantages and disadvantages.

**6. TDMA (Time Division Multiple Access)** is a multiple access technique that divides the time axis into slots and assigns each user to a specific slot. This allows each user to use the entire channel bandwidth for a short period of time.

**7. The functions of MSC (Mobile Switching Center) are:**

- To establish and terminate mobile calls
- To route mobile calls to the appropriate destination
- To manage the mobility of mobile users
- To provide authentication and authorization services

**8. The advantages of the 2G wireless system include:**

- Increased voice capacity
- Improved voice quality
- Support for data services

**9. The difference between connection-oriented service and connectionless service** is that connection-oriented service establishes a dedicated connection between two devices before data is transmitted. This connection is then maintained for the duration of the data transfer.

Connectionless service, on the other hand, does not establish a dedicated connection. Instead, data is transmitted in packets, and each packet is treated independently.

**10. The datagram approach** is a connectionless service that transmits data in packets. Each packet contains the destination address, the source address, and the data itself. The packets are transmitted independently of each other, and they may not arrive at the destination in the same order that they were transmitted.

**11.a The expression for probability of error in flat-fading channels** depends on the modulation scheme and the signal-to-noise ratio (SNR). For example, for binary antipodal modulation (BPSK), the probability of error is given by:

$$P_e = Q(\sqrt{E_b/N_0})$$

where  $E_b$  is the energy per bit,  $N_0$  is the noise power spectral density, and  $Q$  is the Marcum Q-function.

Here are the additional definitions and explanations you requested:

**1. The functions of Gaussian filter GMSK** are:

- To reduce the bandwidth of a signal
- To improve the spectral efficiency of a signal
- To make a signal more resistant to interference

**2. The difference between micro and macro diversity** is that micro diversity uses antennas that are close together, while macro diversity uses antennas that are far apart. Micro diversity is more effective for mitigating the effects of short-term fading, while macro diversity is more effective for mitigating the effects of long-term fading.

**3. SDMA (Space Division Multiple Access)** is a multiple access technique that uses multiple antennas at both the transmitter and the receiver to improve the performance of a wireless system. By using multiple antennas, SDMA can increase the spatial diversity of the system, which can reduce the effects of interference and improve the overall reliability of the link.

**4. The advantages of SDMA over FDMA and TDMA** include:

- Increased capacity
- Improved spectral efficiency
- Reduced interference

I hope this information is helpful. Please let me know if you have any other questions.