

PHYSICS

KEY TERMS

Communication Systems

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1. **Information Source.** It is a non- electrical signal source e.g. a source producing music voice, speech etc.
2. **Transducer.** It is a device which converts one form of energy into another e.g., a microphone which converts speech into electrical signal or a speaker which converts electrical signal into sound. Transducer converting pressure, light, temperature, frequency, displacement etc. into electrical signals are also in common use.
3. **Transmitter** is a device which processes the information to make it fit for sending through some medium to a destined place.
4. **Amplifiers.** Generally semiconductor amplifiers or doped fibre amplifiers are used to limit directly boost the signal.
5. **Modulators.** Modulation can be done by using an external modulator following the source. The simplest form of direct modulation is to change the low frequency signal in accordance with high frequency carrier wave so that it becomes fit to reach the far places.
6. **Filters.** They are essential components to minimize the cross talk between channels. These are basically tuned LC circuits which allow only a particular band of frequency to pass through them.
7. **Antennas.** An antenna is a metallic structure used radiate or receive electromagnetic waves.
8. **Receiver.** It is a device capable of faithfully extracting the send information from the signal received by it. The receiver also consists of antenna, filters amplifiers. Another important part of receiver is detector or demodulator circuit.
9. **Detectors.** Signal emerging from the end of a communication link must be detected and converted into electronic pulses for further processing so that the transmitted information can return to its original form.
10. **Repeaters.** To increase the range of the transmission of microwaves, number of in- between sets of receivers and transmitters are erected.
11. **Communication.** It is the faithful transfer of signal information, data or message from one point to other by some special electrical/ electronic means.
12. **Information.** For the purpose of communication, information is a useful or intelligible message in the form of speech, pictures, words codes, symbols,

commands, data etc. These messages come from some source known as information source. The group of such messages is known as set of information.

13. **Signal in communication** means a function of time having single unique value at every moment of time.
14. **Analog signal.** *It is a continuous wave form which changes smoothly over time.*
15. **Amplitude.** The height of the signal with respect to mean life of the wave is known as the amplitude of the analog signal. It is denoted by A.
16. **Time period.** The time taken by an analog signal to complete one cycle is called time period or period of the signal. It is denoted by T .
17. **Frequency.** The position of the waveform of the signal with respect to time when it is zero is known as phase.
18. **Phase.** The position of the waveform of the signal with respect to time when it is zero is known as phase.
19. **Digital Signals.** *It is a discrete signal having values represented by 1 and 0 only*. Data or information can also be represented by a digital signal.
20. **Bit.** Either of 0 and 1 is known as a bit.
21. **Byte.** A group of bits is known as a byte.
22. **Bit interval.** The time taken to complete one bit is called bit interval.
23. **Bit rate.** The number of bit intervals completed in one second is called bit rate. Bit rate is expressed in bits per second (bps)
24. **Encoding.** The information in analog or digital forms can be transmitted from one place to another by converting it into analog or digital signals. The process of converting an information into analog or digital signals is known as encoding.
25. **Modulation.** The process of the placement or mounting of a low frequency signal over the high frequency signal is known as modulation.
26. **Attenuation.** It basically means power loss of information strength.
27. **Dispersion.** As the transmission pulses travel forward in the medium, they get broadened due to dispersion. If adjacent pulses are broadened due to the dispersion at a point where they severely overlap each other, detection of the individual pulses at the receiver is not easily possible.
28. **Noise.** It is defined as a disturbance or unwanted element or foreign interfering with the desired information or signal.

- 29. Detection i.e. demodulation.** It is the extraction of audio frequency signal from de-modulator which is fed to the audio frequency amplifier where it is amplified. The amplified audio frequency signal is given to the speaker, which converts it into original speech (i.e., sound wave)
- 30. Frequency spectrum and Band width.** A complex or a composite signal is the collection of many components. Each component has different frequencies. The collection of all the component frequencies of a signal is known as the frequency spectrum of the signal. The width of the frequency spectrum is known as band width (BW) of the signal.
- 31. Channel.** The term 'channel' is commonly used to specify the frequency range allotted to a particular transmission from a broadcast station or a transmitter e.g., a telephone channel, a television channel etc.
The term channel is also used for a transmitter and a receiver. i.e., cable, optic fibre, air etc.
- 32. Ground wave propagation.** In this type of transmission radio waves travel along the surface of the earth.
- 33. Atmosphere.** The envelope of gases surrounding the earth's surface is known as atmosphere.
- 34. Sky Wave Propagation.** The radio waves which are reflected back to the earth by ionosphere are known as sky waves.
- 35. Critical frequency (CF)** is defined as the highest frequency that is returned to the earth by the considered layer of the ionosphere a frequency that is returned to the earth by the considered layer of the ionosphere after having been sent straight (normally) to it.
Critical frequency is approximately given by, $f_c = 9(N_{\max})^{1/2}$, where N_{\max} is the maximum electron density of the ionosphere.
- 36. Fading** is defined as the variation in the strength of a signal at a receiver due to interference of waves. Fading is more at high Frequencies.
- 37. Demodulation i. e., Detection of an Amplitude Modulated Wave.** The process of extracting the audio signal from the modulated wave is known as demodulation or detection.

Note : if any mistake on this, kindly inform on the mail id :

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