Probable Q & A on DC 02

1. Define noise.
Noise is defined as any unwanted form of energy, which tends to interfere with proper reception
and reproduction of wanted signal.

2. Give the classification of noise.
Noise is broadly classified into two types. They are
(i)External noise
(ii)Internal noise.

3. What are the types of External noise?
External noise can be classified into
1. Atmospheric noise
2. Extraterrestrial noises
3. Man –made noises or industrial noises

4. What are types of internal noise?
Internal noise can be classified into
1. Thermal noise
2. Shot noise
3. Transit time noise
4. Miscellaneous internal noise

5. Define signal to noise ratio.
Signal to noise ratio is the ratio of signal power to the noise power at the same point in a system.

It decides quality of transmission system.

6. Define thermal noise. Give the expression for the thermal noise voltage across a resistor.
The electrons in a conductor possess varying amounts of energy. A small fluctuation in this energy
produces small noise voltages in the conductor. These random fluctuations produced by thermal agitation of
the electrons is called thermal noise.

7. What is narrowband noise?
The receiver of a communication system usually includes some provision for preprocessing the received
signal. The preprocessing may take the form of a narrowband filter whose bandwidth is large enough to
pass modulated component of the received signal essentially undistorted but not so large as to admit
excessive noise through the receiver. The noise process appearing at the output of such filter is called
narrow band noise.

8. Define noise temperature. (In terms of hypothetical temperature)

The available noise power is directly proportional to temperature and it is independent of value of
resistance. This power specified in terms of temperature is called as noise temperature. It is denoted by Te .

9. What is shot noise?

When current flows in electronic device, the fluctuations number of electrons or holes generates the noise.
It is called shot noise. Shot noise also depends upon operating conditions of the device.

10. What is White Noise?

Many types of noise sources are Gaussian and have flat spectral density over a wide frequency range. Such
spectrum has all frequency components in equal portion, and is therefore called white noise. The power
spectral density of white noise is independent of the operating frequency.

11. Define noise factor.

Noise factor (F) is defined as the ratio of signal to noise power ratio at the input to signal to noise power
ratio at the output

12. Give the characteristics of shot noise.

(i) Shot noise is generated due to fluctuations in the number of electrons or holes. (ii) Shot noise has
uniform spectral density.
(iii) Mean square noise current depends upon direct component of current. (iv) Shot noise depends upon
operating conditions of the device.

13. Define noise equivalent bandwidth.

The noise equivalent bandwidth of the filter is defined as the bandwidth of an ideal filter at which the noise
power passed by real filter and ideal filter is same.

14. Define Pre-Emphasis?

Pre-Emphasis is the process of boosting the information signal in order to reduce the noise occurrence.

15. Define De-Emphasis?

De-Emphasis is the process in which the boosted signal is brought down to normal information signal
present at initial.

16. What is M array encoding?

This is the type of digital modulation technique used for data transmission in which instead of one bit, two or more bits are transmitted at a time. As a single signal is used for multiple bit transmission, the channel bandwidth is reduced.

An M-ary transmission is a type of digital modulation where instead of transmitting one bit at a time, two or more bits are transmitted simultaneously. This type of transmission results in reduced channel bandwidth.

It has better performance than ASK and FSK. Minimal phase estimation error at the receiver. The bandwidth efficiency of M-ary PSK decreases and the power efficiency increases with the increase in M.

17. What are the different modulation techniques of optical fiber?

According to the particular optical-field parameter being modulated, optical modulation can be categorized into different modulation schemes: phase modulation, frequency modulation, polarization modulation, amplitude modulation, spatial modulation, and diffraction modulation.

18. What is the purpose of encoding and modulation?

Modulation is something when you change the characteristics(amplitude,frequency or phase) of a carrier wave to represent your data. Encoding is just a way to change a data to a different form.It has nothing to do with the inherent core data present.
Encoding is about converting digital or analog data to digital signal, whereas modulation is about converting digital or analog data to an analog signal. Encoding is used to ensure efficient transmission and storage, whereas modulation is used to send the signals to a long way.

19. Explain metallic transmission lines in data communication.

Metallic transmission lines includes open-wire, twin-lead, and twisted-pair copper wire as well as coaxial cable, and optical fibers include plastic- and glass-core fibers encapsulated in various kinds of cladding materials.

20. What is a linear PCM?

Linear Pulse Code Modulated Audio (LPCM) Description. Pulse code modulation (PCM) with linear quantization. PCM is a digital representation of an analog signal where the magnitude of the signal is sampled regularly at uniform intervals, then quantized to a series of symbols in a digital (usually binary) code.

21. What is non linear PCM?

Non Linear Codes. • The step size increases with the amplitude of the input signal. Companding. • An operation in which the dynamic range of signals is compressed before. transmission and is expanded to the original value at the receiver.

22. Why is the non linear PCM coding used?

This is a non-linear technique used in PCM which compresses the data at the transmitter and expands the same data at the receiver. The effects of noise and crosstalk are reduced by using this technique. There are two types of Companding techniques.

23. What are the three types of PCM?

Types of PCM

PCM is two types of Differential Pulse Code Modulation (DPCM), Adaptive Differential Pulse Code Modulation (ADPCM) & Linear Pulse Code Modulation.

24. What are the principles of PCM?

In a PCM system, the primary signal function with its subtle amplitude variations is transformed into a secondary signal. This signal is merely a sequence of on-off pulses, or marks and spaces where the pulse amplitude, the pulse width, or the pulse position does not vary.

25. What is sampling in PCM?
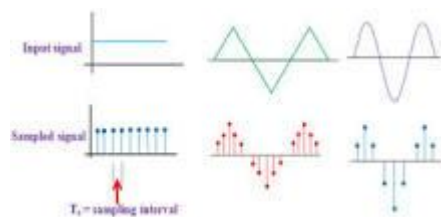
Sampling process results in signal that is discrete in time but analog in amplitude. Sampling is the process of measuring the amplitude of a continuous-time signal at discrete instants. It converts a continuous-time signal to a discrete-time signal.

26. What Does Companding Mean?
Companding refers to a technique for compressing and then expanding (or decompressing) an analog or digital signal. It is a combination of the words "compressing" and "expanding."
The companding technique has a number of advantages in digital communication systems. It enhances the transmitted signal's SNR, which is one of the key benefits. This is due to the fact that the companding procedure lowers the signal's noise amplitude, which raises the transmitted signal's SNR.

27. What is companding and its types?

The word Companding is a combination of Compressing and Expanding, which means that it does both. This is a non-linear technique used in PCM which compresses the data at the transmitter and expands the same data at the receiver. The effects of noise and crosstalk are reduced by using this technique.

28. What is modulation?
Modulation is the process of encoding information in a transmitted signal, while demodulation is the process of extracting information from the transmitted signal. Many factors influence how faithfully the extracted information replicates the original input information.

29. What is modulation and types?
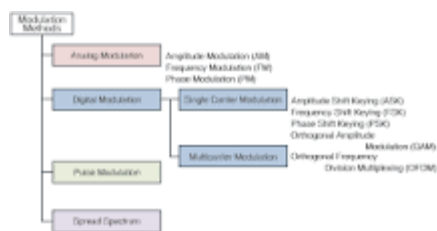
Modulation is the process of converting data into electrical signals optimized for transmission. Modulation techniques are roughly divided into four types: Analog modulation, Digital modulation, Pulse modulation , and Spread spectrum method.

30. What is modulation and example?

Modulation can be defined as the process of conversion of data into waves by adding information to a carrier signal. Such a signal can be an electronic or an optic carrier, but most importantly, it should possess a steady waveform.

31. What are the basics of modulation?
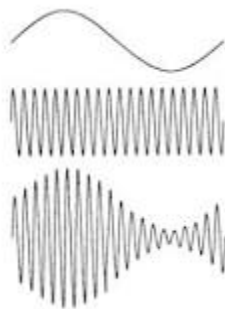
Modulation is the act of changing a signal to transmit useful data. There are three aspects of a signal that can be modulated; amplitude, frequency, and phase.

32. Which modulation is better?

The sound quality is better in frequency modulated signal waves. Though the sound quality is poorer, the amplitude modulated waves travel longer distances than frequency modulated signals. Though the sound quality is better, frequency modulated signals travel shorter distances than amplitude modulated waves.