1. Which type of receiver suffers from the “image signal” problem?
a) Superheterodyne
b) Tuned radio frequency (TRF)
c) AM transmitter
d) FM transmitter

Answer: b) Tuned radio frequency (TRF)
Explanation: In a TRF receiver, due to its lack of frequency selectivity, it can receive both the desired signal and an undesired signal called the image signal, resulting in interference.

2. What is the function of Intermediate Frequency (IF) in a superheterodyne receiver?
a) To amplify the received signal
b) To demodulate the signal
c) To reject image signals
d) To provide a constant frequency for further processing

Answer: c) To reject image signals
Explanation: The IF stage in a superheterodyne receiver filters out the unwanted image signals and amplifies the desired signal.

3. Which parameter determines a receiver’s ability to separate desired signals from undesired signals?
a) Sensitivity
b) Fidelity
c) Selectivity
d) Noise figure

Answer: c) Selectivity
Explanation: Selectivity refers to a receiver's ability to discriminate between wanted and unwanted signals, usually measured by the bandwidth over which it can operate effectively.

4. What is the primary factor affecting the fidelity of an AM transmission?
a) Receiver sensitivity
b) Receiver selectivity
c) Carrier frequency stability
d) Signal-to-noise ratio

Answer: d) Signal-to-noise ratio
Explanation: Fidelity in AM transmission depends on how well the original audio signal is preserved in the presence of noise, which is determined by the signal-to-noise ratio.

5. What is the primary source of noise in analog modulation systems?
a) Atmospheric disturbances
b) Interference from adjacent channels
c) Electronic circuitry
d) Thermal agitation in electronic components

Answer: d) Thermal agitation in electronic components
Explanation: Thermal noise, caused by the random motion of electrons within conductors, is a significant source of noise in analog modulation systems.

6. Which parameter quantifies the ability of a receiver to handle noise?
a) Noise figure
b) Noise bandwidth

c) Noise temperature
d) Signal-to-noise ratio

Answer: a) Noise figure
Explanation: Noise figure measures how much a receiver degrades the signal-to-noise ratio of the input signal.

7. What does the noise temperature of a device indicate?
a) The temperature at which the device operates
b) The level of noise generated by the device
c) The device's sensitivity to external noise
d) The amount of noise power produced by the device

Answer: b) The level of noise generated by the device
Explanation: Noise temperature quantifies the amount of noise power generated by a device, analogous to the thermal noise generated by a resistor at a specific temperature.

8. Which type of modulation is more susceptible to noise, AM or FM?
a) AM
b) FM
c) Both are equally susceptible
d) Neither are affected by noise

Answer: a) AM
Explanation: AM modulation is more susceptible to noise because changes in amplitude can be easily obscured by noise, leading to degradation in signal quality.

9. How does noise affect the performance of an FM receiver?

a) Increases selectivity
b) Improves fidelity
c) Increases signal-to-noise ratio
d) Degrades signal quality

Answer: d) Degrades signal quality
Explanation: Noise in an FM receiver can interfere with the demodulation process, leading to distortions in the recovered signal and degradation of signal quality.

10. What is the primary figure of merit used to compare the performance of AM and FM systems in the presence of noise?
a) Signal-to-noise ratio
b) Noise figure
c) Modulation index
d) Bandwidth efficiency

Answer: a) Signal-to-noise ratio

Explanation: Signal-to-noise ratio quantifies the quality of the received signal relative to the noise level, making it a primary figure of merit for comparing AM and FM systems in the presence of noise.