1. Which modulation technique utilizes multiple amplitude levels to encode data?

a) ASK
b) BPSK
c) QPSK
d) DPSK

Answer: c) QPSK

Explanation: QPSK (Quadrature Phase Shift Keying) employs four different phase shifts to represent two bits per symbol, thereby achieving higher data transmission rates compared to BPSK.

2. In which modulation scheme is information encoded by varying the phase of the carrier signal?

a) ASK
b) BPSK
c) QPSK
d) DPSK

Answer: b) BPSK

Explanation: BPSK (Binary Phase Shift Keying) modulates the phase of the carrier signal to represent binary data, where a phase shift of 180 degrees represents one binary state, and no phase shift represents the other.

3. Coherent and non-coherent are variants of which modulation technique?

a) BFSK
b) QAM
c) QPSK
d) DPSK

Answer: a) BFSK

Explanation: BFSK (Binary Frequency Shift Keying) can be implemented in both coherent and non-coherent forms, depending on whether phase coherence is maintained between the modulated carrier and the receiver's local oscillator.

4. Which modulation technique is characterized by varying the frequency of the carrier signal to encode digital data?

a) ASK
b) BPSK
c) BFSK
d) MSK

Answer: c) BFSK

Explanation: BFSK (Binary Frequency Shift Keying) modulates the frequency of the carrier signal to represent digital data, where different frequencies represent different binary states.

5. What is the primary advantage of QAM (Quadrature Amplitude Modulation) over ASK (Amplitude Shift Keying)?

a) Higher spectral efficiency

b) Simplicity of implementation
c) Lower susceptibility to noise
d) Greater resistance to multipath fading

Answer: a) Higher spectral efficiency

Explanation: QAM allows for higher data transmission rates by encoding both amplitude and phase information, enabling multiple bits to be transmitted per symbol, thus achieving higher spectral efficiency compared to ASK.

6. Which modulation technique is employed in Minimum Shift Keying (MSK)?

a) ASK
b) BPSK
c) BFSK
d) QPSK

Answer: d) QPSK

Explanation: MSK (Minimum Shift Keying) is a form of continuous-phase frequency shift keying (CPFSK), which is a type of frequency modulation. It is closely related to QPSK and is used in digital communication systems.

7. What is the concept of M-ary PSK (Phase Shift Keying)?

a) It involves multiple phase shifts to encode multiple bits per symbol
b) It utilizes multiple amplitudes to encode multiple bits per symbol
c) It varies the frequency of the carrier signal to encode multiple bits per symbol

d) It combines amplitude and phase variations to encode multiple bits per symbol

Answer: a) It involves multiple phase shifts to encode multiple bits per symbol

Explanation: M-ary PSK involves varying the phase of the carrier signal to represent multiple symbols, each symbol encoding multiple bits of digital data.

8. Which modulation technique is known for its constant envelope property, making it resistant to non-linear distortion?

a) BPSK
b) QPSK
c) MSK
d) QAM

Answer: c) MSK

Explanation: MSK (Minimum Shift Keying) maintains a constant amplitude, resulting in a constant envelope signal, which makes it resilient to non-linear distortion encountered in amplifiers and other RF components.

9. What are the spectral properties of QPSK (Quadrature Phase Shift Keying)?

a) Narrowband and constant envelope
b) Narrowband and variable envelope
c) Wideband and constant envelope
d) Wideband and variable envelope

Answer: a) Narrowband and constant envelope

Explanation: QPSK exhibits a narrowband spectrum due to its sharp transitions between phase states and maintains a constant envelope, which simplifies power amplifier design.

10. Which modulation technique offers the highest data transmission rate among the listed options?

a) ASK
b) BPSK
c) QPSK
d) QAM

Answer: d) QAM

Explanation: QAM (Quadrature Amplitude Modulation) can transmit multiple bits per symbol by varying both amplitude and phase, allowing for higher data transmission rates compared to the other modulation techniques listed.