

MULTIPLE CHOICE QUESTION - UWB

1. _____ also known as impulse or zero-carrier radio technology.

- Ultra wideband technology
- Femtocell technology
- Multicasting
- Multiplexing

Explanation: Ultra-wideband (UWB) technology is also known as impulse or zero-carrier radio technology. It appears to be one of the most promising wireless radio communication technologies of recent time.

2. UWB operates across narrow bandwidth. State whether True or False.

- True
- False

Explanation: Unlike conventional radio systems, which operate within a relatively narrow bandwidth, the UWB radio system operates across a wide range of the frequency spectrum by transmitting a series of extremely narrow (10–1000 per second) and low-power pulses.

3. The basic element in DSC–UWB technology is the monocycle wavelet.

- True
- False

Explanation: The basic element in **TM–UWB technology** is the monocycle wavelet. Typically, wavelet pulse widths are between 0.2 and 1.5 nanoseconds, corresponding to center frequencies between 600 MHz and 5 GHz.

4. In TM–UWB, the system uses a modulation technique called _____

- Pulse width modulation
- Pulse code modulation
- Pulse position modulation
- Pulse amplitude modulation

Explanation: In TM–UWB, the system uses a modulation technique called pulse position modulation. The TM–UWB transmitter emits ultra-short monocycle wavelets with tightly controlled pulse-to-pulse intervals, which are varied on a pulse-by-pulse basis in accordance with an information signal and a channel code.

5. DSC-UWB uses _____

- Pulse width modulation
- Pulse code modulation
- Pulse position modulation
- Direct sequence modulation

Explanation: In DSC-UWB, the signal is spread by direct sequence modulating a wavelet pulse trains at duty cycles approaching that of a sine wave carrier. The spectrum spreading, channelization, and modulation are provided by a PN (pseudo noise) sequence, and the chipping rate is maintained as some fraction of the carrier centre frequency.

6. The coherent interaction of signals in UWB arriving by many paths causes _____

- Ricean fading
- Nakagami fading
- Rayleigh fading
- Multicast fading

Explanation: The coherent interaction of signals arriving by many paths causes the Rayleigh or multipath fading in RF communications. Inside buildings, when continuous sine waves are transmitted wherein the channels exhibit multipath differential delays in the nanosecond range, the multipath fading occurs naturally.

7. UWB technology supports low bit rate and low speed. State whether True or False.

- True
- False

Explanation: UWB technology is appropriate for the high-performance wireless home network, which mandates support for large bit rate (50 Mbps), high-speed, affordable connectivity between devices, and simultaneous data transmission from multiple devices, and full-motion video capability.

8. Which of the following is not true for UWB?

- Large spectrum
- Lower price
- Pulse data
- Large interference

Explanation: The combination of larger spectrum, lower power, and pulsed data means that UWB causes less interference than narrowband radio designs while yielding low probability of detection and excellent multipath immunity.

9. UWB systems are very complex, since they use radio frequency/intermediate frequency conversion stages. State whether True or False.

- True
- False

Explanation: UWB systems are much less complex, since they do not use any radio frequency/intermediate frequency (RF/IF) conversion stages, local oscillators, mixers, and other expensive surface acoustic wave (SAW) filters common to traditional radio technologies.

10. Which of the following is not a drawback of UWB technology?

- Not appropriate for WAN
- Power limited
- Small spectrum
- Limited jitter requirements

Explanation: UWB devices are power limited because they must coexist on a noninterfering basis with other licensed and unlicensed users across several frequency bands. For UWB systems using PPM as their modulation technique, limited jitter requirements could be an issue.