**Unit 3**

**MCQ Bank**

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| --- | --- | --- | --- | --- | --- | --- |
| **1** | Random frequency modulation occurs due to varying \_\_\_\_\_\_\_\_\_ on different multipath signals   1. **Doppler Shifts** 2. Echoes 3. Time interval 4. Doppler shift | **1** | **2** | **3** | **1** | **1.3.1** |
| **2** | Let *x(t)* represent the transmitted signal and *h(d,t)* is the channel impulse response then the received signal *y(d,t)* at position *d* can be expressed as   1. *x(t) . h(t)* 2. *x(t)* x *h(t)* 3. *x(t)* / *h(t)* 4. ***x(t)* \* *h(t)*** | **1** | **3** | **3** | **2** | **2.1.1** |
| **3** | The small-scale variations of a mobile radio signal can be directly related to the \_\_\_\_\_\_\_\_ response of the mobile radio channel.   1. step 2. **impulse** 3. Unit 4. ramp | **1** | **2** | **3** | **1** | **1.3.1** |
| **4** | The power delay profile of channel can be computed using the \_\_\_\_\_\_\_\_\_\_\_\_\_of the squared magnitude of base band impulse response over the local area.   1. **spatial average** 2. spatial median 3. Mean squared error 4. Root mean square | **1** | **3** | **3** | **1** | **1.3.1** |
| **5** | In the \_\_\_\_\_\_\_\_\_\_ method the transmitter chip clock rate is a little faser than the receiver chip clock rate   1. Direct RF Pulse System 2. **Sliding Correlator** 3. Frequency domain channel 4. S- matrix | **1** | **2** | **3** | **1** | **1.3.1** |
| **6** | The\_\_\_\_\_\_\_\_\_ is the first moment of the power delay profile.   1. **Mean Excess Delay** 2. RMS Delay Spread 3. Excess Delay Spread 4. Coherence Bandwidth | **1** | **3** | **3** | **1** | **1.3.1** |
| **7** | \_\_\_\_\_\_\_ do not offer information about the time varying nature of the channel caused by relative motion of transmitter and receiver.   1. **Delay Spread** 2. Doppler Spread 3. Coherence time 4. Mean excess delay | **1** | **3** | **3** | **1** | **1.3.1** |
| **8** | Consider a transmitter which radiates a sinusoidal carrier frequency of 900 MHz. For a vehicle moving at 50 mph, compute the received carrier frequency if the mobile is moving in a direction which is perpendicular to the direction of the arrival of the transmitted signal?   1. 1000 MHz 2. **900 MHz** 3. 850 MHz 4. 950MHz | **1** | **3** | **3** | **2** | **2.1.2** |
| **9** | \_\_\_\_\_\_\_\_ system requires hardwired synchronization between transmitter and receiver.   1. Direct RF Pulse System 2. Sliding Correlator 3. **Frequency domain channel** 4. Spread spectrum correlator | **1** | **3** | **3** | **1** | **1.3.1** |
| **10** | In Spread spectrum sliding correlator channel, the probing signal is wide band but the receiver is \_\_\_\_\_\_\_\_\_\_   1. **Narrow band** 2. Wide band 3. Pass band 4. Base band | **1** | **2** | **3** | **1** | **1.3.1** |
| **11** | In \_\_\_\_\_\_\_\_\_\_\_ channel, bandwidth of the applied signal is narrow compared to the channel bandwidth.   1. **Flat fading** 2. Frequency selective fading 3. Fast fading 4. Slow fading | **1** | **1** | **3** | **1** | **1.3.1** |
| **12** | \_\_\_\_\_\_\_\_\_\_\_\_\_ distributions are used to describe the time varying nature of the received envelop of an individual multipath component   1. Ricean 2. **Rayleigh** 3. Gaussian 4. Normal | **1** | **3** | **3** | **3** | **3.1.3** |
| **13** | The delay spread is greater than the symbol period in \_\_\_\_\_\_\_\_\_.   1. Flat fading 2. **Frequency selective fading** 3. Fast fading 4. Slow fading | **1** | **2** | **3** | **3** | **3.1.3** |
| **14** | During fading, the channel impulse response changes at rapidly within the symbol duration and can cause frequency dispersion due to \_\_\_\_\_\_\_\_\_\_\_   1. Delay Spread 2. **Doppler Spread** 3. Coherence time 4. Mean excess delay | **1** | **3** | **3** | **3** | **3.1.3** |
| **15** | In Ricean distribution, the parameter K is the ratio of the deterministic signal power and the \_\_\_\_\_\_\_\_\_ of the multipath.   1. **Variance** 2. Spatial average 3. median 4. Root mean square | **1** | **3** | **3** | **3** | **3.1.3** |
| **16** | The presence of reflecting objects and scatterers in the channel creates a constantly changing environment that dissipates the signal energy in amplitude, phase, and time is known as \_\_\_\_\_\_\_\_\_.  a) **Multipath propagation**  b) Doppler effect  c) Line of sight  d) Doppler shift | **1** | **2** | **3** | **1** | **1.3.1** |
| **17** | The relative motion between the base station and the mobile results in random frequency modulation due to different Doppler shifts is declared as \_\_\_\_\_\_\_\_.   1. Multipath propagation 2. **Speed of the mobile** 3. Speed of surrounding objects 4. Line of sight | **1** | **3** | **3** | **2** | **2.1.1** |
| **18** | Identify, how the small-scale variations of a mobile radio signal can be related to the impulse response of the mobile radio channel.  a) Indirectly  b) Inversely  c) **Directly**  d) Propagation | **1** | **2** | **3** | **1** | **1.3.1** |
| **19** | In multipath structure, Choose which type of fading is very important?  a) Large scale fading  b) **Small scale fading**  c) Attenuation fading  d) Filters fading | **1** | **3** | **3** | **1** | **1.3.1** |
| **20** | Identify, which method help us to determine the power delay profile directly.  a) **Direct RF Pulse System**  b) Correlator  c) Spectrum sliding  d) Spread spectrum sliding correlator | **1** | **2** | **3** | **1** | **1.3.1** |
| **21** | In Spread spectrum sliding correlator channel, the probing signal is \_\_\_\_\_\_ but the receiver is narrow band.   1. Narrow band 2. **Wide band** 3. Pass band 4. Base band | **1** | **3** | **3** | **1** | **1.3.1** |
| **22** | In frequency Domain channel sounding, S-parameter test set is used to monitor the \_\_\_\_\_\_\_ response of the channel.   1. **Frequency** 2. Time 3. Amplitude 4. Phase | **1** | **3** | **3** | **1** | **1.3.1** |
| **23** | Mention which type of pulse is used in Direct RF pulse system channel sounding.   1. **Narrow band** 2. Wide band 3. Interference 4. Filters | **1** | **3** | **3** | **2** | **2.1.2** |
| **24** | In a spread spectrum channel sounder, a carrier signal is "spread" over a \_\_\_\_\_\_ by mixing it with a binary pseudo-noise sequence having chip rate Tc.   1. Small bandwidth 2. **Large bandwidth** 3. Very small bandwidth 4. Medium bandwidth | **1** | **3** | **3** | **1** | **1.3.1** |
| **25** | Power delay profiles are found by instantaneous power delay profile measurements over a local area.   1. Dividing 2. Subtracting 3. **Averaging** 4. integrating | **1** | **2** | **3** | **1** | **1.3.1** |
| **26** | If the mobile radio channel has a constant gain and linear phase response over a bandwidth which is greater than the bandwidth of the transmitted signal, then the received signal will undergo \_\_\_\_\_\_.   1. **Flat fading** 2. Frequency selective fading 3. Fast fading 4. Slow fading | **1** | **1** | **3** | **1** | **1.3.1** |
| **27** | In Direct RF pulse system which type of response is used to detect in envelope detector.   1. Time 2. Phase 3. **amplitude** 4. frequency | **1** | **3** | **3** | **3** | **3.1.3** |
| **28** | If the channel possesses a constant-gain and linear phase response over a bandwidth that is smaller than the bandwidth of transmitted signal, then the channel creates frequency selective fading on the received signal.   1. Flat fading 2. **Frequency selective fading** 3. Fast fading 4. Slow fading | **1** | **2** | **3** | **3** | **3.1.3** |
| **29** | The channel impulse response changes at a rate much slower than the transmitted baseband signal is referred as \_\_\_\_\_\_\_.   1. Flat fading 2. Frequency selective fading 3. Fast fading 4. **Slow fading** | **1** | **3** | **3** | **3** | **3.1.3** |
| **30** | In Ricean fading distribution, the parameter A denotes the peak \_\_\_\_\_\_\_\_ of the dominant signal.   1. **Amplitude** 2. Phase 3. Time 4. Frequency | **1** | **3** | **3** | **3** | **3.1.3** |

**Unit 3**

**Part B Question Bank**

1. Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz For a vehicle moving 60 mph, compute the received carrier frequency if the mobile is moving a) directly towards the transmitter b) directly away from the transmitter c) in a direction which is perpendicular to the direction of arrival of the transmitted signal.
2. Explain the factors influencing small scale fading.
3. Explain in detail about baseband impulse response model.
4. Discuss in detail about the various parameter of mobile multipath channel.
5. Elucidate the working of direct RF pulse system, with the help of a block diagram.
6. Elucidate the working of spread spectrum sliding correlator channel sounding system, with the help of a block diagram.
7. Elucidate the working of Frequency domain channel sounding system, with the help of a block diagram.
8. Discuss in detail about Rayleigh distributions.
9. Discuss in detail about Ricean distributions.
10. Explain the following fading channel
11. Flat Fading
12. Frequency Selective Fading
13. Fast Fading
14. Slow Fading