

無線通訊網路 資格考

1. Please explain the below terms in details. [25 %]
 - A. Multi-path Effect
 - B. Doppler Shift
 - C. ISI (Inter-Symbol Interference)
 - D. SCO and ACL links (in Bluetooth Baseband)
 - E. FHSS (Frequency Hopping Spread Spectrum)

2. Consider a cruise boat with three passengers. Each passenger will make 2 calls per hour with each call of 5-minute duration. There is only one telephone set on the boat. Please calculate the probability of the phone being occupied by one person while the other two persons wish to make a call. [20%]
 - A. Please draw the Markov Chain,
 - B. Please calculate the blocking probability.

3. Please describe the following protocol in Pseudo code. [20%]
 - A. Slotted Aloha
 - B. nonpersistent CSMA
 - C. CSMA/CD
 - D. CSMA/CA

4. Please calculate the maximum transmission rate for a transmission system when the delay spread is 4 ns (nano-seconds). [7 %]

5. Define the first-meter path loss as the received signal strength (in dB) when the receiver stands one meter away from the transmitter. Now, consider the case when the first-meter path loss is 20dB . Please calculate the free-space path loss for a receiver if the distance between the transmitter and receiver is [12 %]
 - A. 10 meters,
 - B. 100 meters,
 - C. 1 KM.

6. Please explain the following terms in details. [16 %]
 - A. HLR and VLR (of GSM)
 - B. How is a Bluetooth Scatternet formed?
 - C. Backoff mechanism of IEEE 802.11
 - D. Hidden terminal problem