ECE5884 Wireless Communications – Quiz 12 **17 Oct. 2022**

1. What probability distribution is used to model shadow fading?

   (a) Log-normal
   (b) Exponential
   (c) Rayleigh
   (d) Uniform

2. What is a pilot?

   (a) A Brazilian punk band from the 1980s
   (b) A sequence of known (data) symbols transmitted in order to estimate the wireless channel
   (c) A person who flies a plane

3. What is NOT a valid assumption about i.i.d. additive white Gaussian noise (AWGN) ?

   (a) The noise level is linearly dependent on the power of the signal.
   (b) Primary source of noise is at the receiver.
   (c) Noise at two signal samples are independent from each other.
   (d) Noise is independent of the paths over which signal propagates.

4. Which of the following is NOT correct regarding Rayleigh and Rician fading.

   (a) Rayleigh is a good model when there are large number of small reflectors.
   (b) K-factor in Rician fading is the ratio of the energy in direct path to the energy in the scattered paths.
   (c) Rayleigh fading channel has zero-mean Gaussian distributions for both the real and imaginary parts of the channel.
   (d) Rician fading can be represented by a circularly symmetric complex Gaussian random variable.

5. What is the effective capacity from base station (BS) to User with the help of a decode-and-forward (DF) relay? Say that Bs to relay channel and relay to user channel have capacities C_1 and C_2, respectively.

   (a) $0.5 * (C_1 + C_2)$
   (b) $0.5 * \max(C_1, C_2)$
   (c) $0.5 * \min(C_1, C_2)$
   (d) $C_1 + C_2$

6. What is the effective capacity from BS to User with the help of an Reconfigurable Intelligent Surface (RIS), instead of relay?

   (a) $0.5 * (C_1 + C_2)$
   (b) $0.5 * \max(C_1, C_2)$
   (c) $0.5 * \min(C_1, C_2)$
   (d) None of the above