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M.Tech. ECE (Wireless Communication) (2018 Batch) (Sem.-1)**WIRELESS COMMUNICATION****Subject Code : MTWC-101-18****M.Code : 75797****Time : 3 Hrs.****Max. Marks : 60****INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries TWELVE marks.

1. Compare classical MRRC scheme with two branch diversity with one receiver 2×1 schemes for transmission and reception ends. Also explain the concept of soft failure.
2. Discuss in detail : Ergodic capacity and Outage capacity with mathematical expression in the AWGN channel.
3. What is MIMO multi-user communication? Briefly discuss with the help of block diagram. How scheduling is done in the multi user scenario?
4. Discuss two ray model to illustrate the multipath effects in detail. If the transmitter-receiver separation $d = 100\text{m}$, $h_t = 10\text{ m}$ and $h_r = 2\text{ m}$, find the delay spread between two signals.
5. Discuss TDMA, FDMA, CDMA and CSMA schemes in brief.
6. Consider a 2×2 MIMO system with channel gain matrix is given by H . Assume H is known at transmitter and receiver and the total transmit power $P = 10\text{ mW}$ is available across two transmit antennas. Assume $N_0 = 10^{-9}\text{ W/Hz}$ at each receive antenna and bandwidth $B = 100\text{ KHz}$.

$$H = \begin{bmatrix} 0.3 & 0.5 \\ 0.7 & 0.2 \end{bmatrix}$$

- a) Find SVD for H
 - b) Find the capacity of this channel
7. Why successive interference cancellation is a promising technique in wireless communication? Support your answer with necessary expression and block diagram.
 8. How precoding is different from beam-forming? Discuss the concept of opportunistic beam forming with dumb antennas.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.

