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**M.E. / M.TECH. DEGREE EXAMINATIONS, MAY 2019**

Second Semester

**CU18202 – WIRELESS COMMUNICATION ENGINEERING***(Communication Systems)***(Regulation 2018)****Time: Three Hours****Maximum : 100 Marks**Answer **ALL** questions**PART A - (10 X 2 = 20 Marks)**

1. Compare small scale fading and large scale fading.
2. Define EIRP.
3. What do you mean by capacity with outage?
4. List the differences between flat fading and frequency selective fading.
5. State the principle of diversity.
6. Give the advantage of receiver diversity.
7. Why multiple antennas are used in MIMO system?
8. Can you distinguish between the Multiplexing gain from Diversity Gain?
9. What is multiple access?
10. Discriminate Uplink and Downlink channel.

**PART B - (5 X16 = 80 Marks)**

11. (a) Explain in detail about the three significant wave propagation mechanisms that affect the propagation of EM waves. **(16)**

**(OR)**

- (b) (i) With neat diagrams, examine the working principle of 2-ray ground reflection model by considering both LOS and reflected signal. **(8)**
- (ii) Compare any two outdoor propagation channel models. **(8)**

12. (a) Draw the system model of flat fading channel and explain in detail. **(16)**

**(OR)**

- (b) (i) The time- varying channel, with a bandwidth of 30 KHz and three possible received SNRs:  $\gamma_1 = .8333$  with  $p(\gamma_1) = 0.1$ ,  $\gamma_2 = 83.33$  with  $p(\gamma_2) = 0.5$ , and  $\gamma_3 = 333.33$  with  $p(\gamma_3) = 0.4$ . Compute the ergodic capacity of this channel assuming both transmitter and receiver have instantaneous CSI. (6)
- (ii) Explain in detail the Capacity of Frequency-Selective Fading Channels. (10)
13. (a) Explain the function of Transmit diversity for known and unknown channel. (16)
- (OR)**
- (b) Explain the Receiver diversity Techniques: a) Selection Combining b) Threshold Combining c) Maximum Ratio Combining d) Equal Gain Combining Techniques in diversity. (16)
14. (a) How could you perform the Transmit Precoding and Receiver shaping of Parallel Decomposition of the MIMO channel. (16)
- (OR)**
- (b) How the Blast Architecture is helpful for offering spatial multiplexing over multiple-antenna wireless communication systems. (16)
15. (a) Compare FDMA, TDMA, CDMA & SDMA with suitable diagrams. (16)
- (OR)**
- (b) Investigate the Scheduling and Power Control in multi user environment. (16)