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M.E./M.TECH. DEGREE EXAMINATIONS, MAY/JUNE 2017

SECOND SEMESTER

COMMUNICATION SYSTEMS

CU16201 – WIRELESS COMMUNICATION NETWORKS

(Regulation 2016)

Q. Code: 639212

Time: Three Hours

Maximum : 100 Marks

Answer **ALL** questions

PART A - (10 X 2 = 20 Marks)

1. What is scattering?
2. What are the advantages of Hata Model?
3. Differentiate microdiversity and macrodiversity.
4. What are smart antennas?
5. Explain MIMO beamforming.
6. Define multiplexing gain.
7. What is multiple access?
8. Consider a slotted ALOHA system with a transmission rate of $R = 10$ Mbps. Suppose packets consist of 1000 bits. For what packet arrival rate λ will the system achieve maximum throughput, and what is the effective data rate associated with this throughput?
9. Compare 3G and 4G systems.
10. What is software defined radio?

PART B - (5 X16 = 80 Marks)

11. (a) Describe the two ray model with neat diagrams. (16)

(OR)

- (b) (i) Explain HATA model and its COST 231 extension. (8)
- (ii) Describe in detail the NLOS Multipath fading model. (8)

12. (a) (i) Explain the principle of maximum ratio combining in detail. (12)
(ii) Compare the average probability of bit error of BPSK under MRC and EGC two-branch diversity with i.i.d. Rayleigh fading with average SNR of 10 dB on each branch. (4)
- (OR)**
- (b) Discuss the transmitter diversity with respect to the different assumptions about the channel knowledge at the transmitter. (16)
13. (a) (i) Discuss in detail about Narrow band MIMO model. (8)
(ii) Derive the MIMO Channel Capacity for static channels. (8)
- (OR)**
- (b) Explain Spatial Multiplexing and BLAST Architectures. (16)
14. (a) Explain the various random access techniques for multiuser systems with neat diagrams. (16)
- (OR)**
- (b) Explain in detail about Multiuser diversity and MIMO multiuser systems. (16)
15. (a) With neat diagram explain the architecture of IEEE802.11 WLAN. (16)
- (OR)**
- (b) (i) Discuss the following: UMTS Basics and 3GPP Architecture. (10)
(ii) Explain the 4G key challenges and their solutions. (6)