Jaypee University of Information Technology
MAKEUP EXAMINATION -2016
B.Tech. 8th Sem. (ECE)/M.tech. (ECE) 2nd Sem.

Subject code: 10M11EC212   MAX. MARKS: 25

Subject name: Advance Wireless and Mobile Communication

Course Credits: 03   MAX. TIME: 1Hr. 30min.

All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q1 a) A cellular service provider decides to use a digital TDMA scheme which can tolerate a signal-to-interference ratio of 15dB in the worst case. Find the optimal value of N for

(i) ohmnidirectional antennas, (ii) 120 degree sectoring, and (iii) 60 degree sectoring. Should sectoring be used? If so, which case (60 degree or 120 degree) should be used? (Assume a path loss exponent of n=4 and consider trunking efficiency.)   (3)

b) Explain with the help of timing diagram that how a call is established in cellular system. (4)

Q2 a) Expain level crossing rate. Given that a Rayleigh-faded mobile radio signal has a level crossing rate of $N_r = \sqrt{2\pi}\rho f_m e^{-\rho^2}$, find the value of ρ for which N_r is a maximum.   (3)

b). Explain various time dispersive and frequency dispersive parameters in mobile multipath channel.   (4)

Q3 Differentiate between small scale and large scale fading. What are different types of large scale fading models. Explain.   (5)

Q4 a) For each of the three scenarios below, decide if the received signal is best described as undergoing fast fading, frequency selective fading, or flat fading.

(i) A binay modulation has a data rate of 500kbps, f_c=1GHz and a typical urban radio channel is used.

(ii) A binary modulation has a data rate of 5kbps, f_c=1GHz and a typical urban radio channel is used to provide communications to cars moving on a highway.

(iii) A binary modulation has a data rate of 10bps, f_c=1GHz and a typical urban radio channel is used to provide communications to cars moving on a highway.   (3)

b) Assume four branch diversity is used, where each branch receives an independent Rayleigh fading signal. If the average SNR is 30dB, determine the probability that the SNR will drop below 15dB. Compare this with the case of a single receiver without diversity.   (3)