VELAMMAL INSTITUTE OF TECHNOLOGY, CHENNAI- 601204

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

ASSIGNMENT QUESTIONS

Academic Year	2017-2018		
Batch	2014-2018		
Year/Semester/section	IV/VIII/A		
Subject Code-Title	EC6801 WIRELESS COMMUNICATION		
Name of the Faculty	Mrs.D.JEYAMANI LATHA	Dept	ECE

Date	Date of Issue:03/01/18Date of Submission:10/01/18					
SI. No	Assignment Questions	K Level	CO	Marks		
1.	(a) Illustrate why or why not ,in the following cases ,whether the two – ray model could be applied ,and: Case(i):h ₁ =35m, h _r =3m, d=250 m Case(ii)h ₁ =30m ,h _r =1.5m, d=450 m (b) Solve that in the two-ray ground reflected model, $=d"-d'=2h_t h_r/d$	Apply	CO1	5		
2.	 (a) Calculate the received power at a distance of 10 km, If a transmitter produces 50W of power, which is applied to unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100m from the antenna. Assume unity gain for the receiving antenna. (b) Calculate the proper sampling interval required to make small scale propagation measurements which assume that consecutive samples are highly correlated in time. How many samples will be required over 10m travel distance if fc=1900 MHz and v=50m/s. How long would it take to make these measurements, assuming they could be made in real from a moving vehicle? What is the Doppler spread B_D for the channel? 		COI	5		
3.	 (a) Solve the optimal value of N for a cellular service provider decides to use a digital TDMA scheme which can tolerate a signal -to-interference ratio of 15 dB in the worst case. (1) Omni directional antennas (2)120° sectoring (3)60° sectoring (4)Should sectoring be used? If so, which case (60° or 120°) should be used?(Assume a path loss exponent of n=4 and consider trunking efficiency) (b) Construct the equitable distribution of control channels and voice channels in each cell of the three given systems. If a total of 33MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels. Compute the number of channels available per cell if a system uses(1)four cell reuse (2)seven cell reuse and(3) twelve cell reuse. If 1 MHz of the allocated spectrums is dedicated to control channels 	Apply	CO2	5		

4.	 (a) Solve for the number of simultaneous users that can be accommodated in GSM.Consider Global system for Mobile,which is a TDMA/FDD system that uses 25 MHz for the forward link ,which is broken into radio channels of 200 MHz.If 8 speech signals are supported on a single radio channel and if no guard band is assumed (b) Demonstrate (1)time duration of a bit(2)the time duration of a slot (3)the time duration of a bit and (4) how long must a user copying a single time slot wait between two successive transmission?If GSM uses a frame structure where each frame consists of eight time slots, and each time slot contains 156.25bits,and data is transmitted at 270.833 kbps in the channel . 	Apply	CO2	5			
Assignment No: 2Total marks:20Date of Issue: 7/02/18Date of Submission: 15/02/18							
1.	 Demonsrtate the following for an Erlang C system that has a 5% probability of a delayed call: A hexagonal cell within a four-cell system has a radius of 1.387 km. A total of 60 channels are used within the entire system. If the load per user is 0.029 Erlangs and =1 call/hour, [Data: from Erlang C chart,5% probability of delay with C=15,traffic intensity=9.0 Erlang] (i) How many users per square kilometer will this system support/ (ii) What is the probability that a delayed call will have to wait for more than 10 sec? Infer the power in each sideband. What percentage of the total power is 	Understand	CO3	5			
2.	in the carrier? If A zero mean sinusoidal message is applied to a transmitter that radiates an AM signal with 10kW power. Compute the carrier power if the modulation index is 0.6.	Onderstand		5			
3.	Solve for the maximum Doppler shift ,the coherence time of the channel and the maximum number of symbols that could be transmitted without updating the equalizer ,assuming that the symbol rate is 24.3 ksymbols/sec.Consider the design of the US Digital cellular equalizer, where f=900 MHz and the mobile velocity v=80 km/hr.	Apply	CO4	5			
4.	Construct the probability that the SNR will drop below 10 dB ,If the average SNR is 20 dB,.Compare this with the case of single receiver without diversity.Assume four branch diversity is used, where each branch receives an independent Rayleigh fading signal.	Apply	CO4	5			
Assignment No: 3 Total marks:10Date of Issue: 21/02/18Date of Submission: 27/02/18							
1	Experiment with the Bit error rate of Wi Fi using MATLABExperiment with the Bit error rate of Wi Max using MATLAB.	Apply Apply	CO6 CO6	5 5			



HOD/ECE

