E **Reg. No. :** | | | | | | | | | | |

Question Paper Code: 53S01

M.E. DEGREE EXAMINATION, NOV 2018

Third Semester

Communication Systems

15PCM301 - WIRELESS COMMUNICATION ENGINEERING

(Regulation 2015)

Duration: Three hours Maximum: 100 Marks

Answer ALL Questions

PART - A (5 x 20 = 100 Marks)

1.	(a)	Explain composite fading and link budget power design in details.	CO1- U	(20)
		Or		
	(b)	(i) Longly-rice model explain in brief	CO1- U	(10)
		(ii) Explain the multipath fading models of Reyleigh and Rician.	CO1- U	(10)
2.	(a)	Explain the channel side information at transmitter and receiver in flat fading.	CO2- U	(20)
		Or		
	(b)	Discuss the channel side information at receiver in flat fading channel.	CO2- U	(20)
3.	(a)	Explain the receiver diversity and discuss:		
		(i) Channel known at transmitter.	CO3-U	(10)
		(ii) Alamouti scheme.	CO3-U	(10)
		Or		

(b) Consider a cellular system where the power falloff with distance follows the formula $P_r(d) = P_t(d_0/d)\alpha$,where $d0$ = 100m and α is a random variable. The distribution for α is p (α = 2) = 0.4, $p(\alpha = 2.5) = 0.3$,$p(\alpha = 3) = 0.2$, and $p(\alpha = 4) = 0.1$ Assume a receiver at a distance d = 1000 m from the transmitter, with an average transmit power constraint of P_t= 100 mW and a receiver noise power of 1 mW. Assume both transmitter and receiver has CSI. C03-App

(i) Compute the distribution of the received SNR. (10)

(ii) Determine the maximum outage capacity per unit bandwidth of this channel. (10)

4. (a) Define and explain about OFDM and derive for the matrix representation. CO4- U (20)

Or

(b) Explain and derive the equation for why we go for cyclic prefix in discrete implementation of multi carrier modulation. CO4- U (20)

5. (a) Explain the narrow band MIMO model and parallel decomposition of the channel. CO5- U (20)

Or

(b) Discuss the trade-off between diversity and multiplexing in a MIMO communication system. CO5- U (20)