

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC - SEMESTER-VIII • EXAMINATION – SUMMER 2013

Subject Code: X81102

Date: 13-05-2013

Subject Name: Wireless Communication

Time: 10.30 pm - 01.00 pm

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) Explain the frequency reuse concept. **07**
(b) Discuss various channel allocation schemes. **07**
- Q.2** (a) Describe ground reflection model for mobile radio wave propagation. **07**
(b) Which factors affect small scale fading ? How ? **07**
- OR**
- (b) Define and explain coherence time and coherence bandwidth. **07**
- Q.3** (a) Compare TDMA and CDMA for mobile communication. **07**
(b) Describe architecture of GSM system. **07**
- OR**
- Q.3** (a) Explain signal processing in GSM. **07**
(b) How do diversity techniques improve SNR? **07**
- Q.4** (a) Assume a receiver is located 10 km from a 50 W transmitter. The carrier frequency is 900 MHz. Free space propagation is assumed. If $G_t=1$ and $G_r=2$, determine the power at the receiver, magnitude of the E field at the receiver antenna and rms voltage applied to receiver input assuming that receiver antenna has a purely real impedance of 50 ohms and is matched to the receiver. **07**
(b) Given a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz. **07**
For a vehicle moving at 60 kmph, calculate the received carrier frequency if
(i) the mobile is moving directly toward the transmitter
(ii) the mobile is moving directly away from the transmitter
- OR**
- Q.4** (a) For a particular FDD cellular telephone system, a total of 33 MHz of bandwidth is allocated. This FDD cellular telephone system uses two 25 kHz simplex channels to provide full duplex voice and control channels. Calculate the number of channels available per cell if a system uses **07**
(i) 4-cell reuse concept
(ii) 7-cell reuse concept
(iii) 12-cell reuse concept
(b) If a signal-to-interference ratio of 15 dB is needed for satisfactory forward channel performance of a cellular system, what will be the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent $n=4$. Calculate the same if $n=3$. **07**
- Q.5** (a) Which are different multipath channel measurement techniques? Discuss any one of these techniques. **07**
(b) How power control is achieved in CDMA? **07**

OR

- Q.5** (a) Compare WI-FI and WI-MAX standards with reference to important system parameters. **07**
- (b) Describe GPRS system architecture. **07**
