# **GUJARAT TECHNOLOGICAL UNIVERSITY** ME – SEMESTER-1 (OLD) EXAMINATION – WINTER 2016

### Subject Code: 710206N Subject Name: Wireless Computer Networks Time:10:30 am to 1:00 pm Instructions:

## Date:23/11/2016

**Total Marks: 70** 

- 1. Attempt all questions.
  - 2. Make suitable assumptions wherever necessary.
  - 3. Figures to the right indicate full marks.
- Q.1 (a) What do you understand by fading in wireless communication? Explain briefly 07 different types of fading.
  - (b) Let us consider that a receiver located at a distance of 1km from the source, receives the signal with a strength of 1  $\mu$ watt. Assuming free space propagation mode of communication, compute received power at distance of 2, 4 and 8 km from the same source and give an analysis of your observation.
- Q.2 (a) What are the basic features of Orthogonal Frequency Division Multiplexing 07 (OFDM)? How does OFDM saves bandwidth compared to Frequency Division Multiplexing (FDM)?
  - (b) How the Wideband Time Division Multiple Access (WTDMA) does different from Narrowband Time Division Multiple Access (NTDMA)? Discus about the spectral efficiency of WTDMA.

#### OR

- (b) What is the importance of diversity in wireless communication? State various 07 categories of diversity.
- Q.3 (a) Consider a situation where you have assigned 25MHz of bandwidth to set up a cellular network. If each subscriber needs 30KHz of bandwidth for voice communication, how many users can be accommodated if you use a single antenna? If you use 20 low power antennas, with 4 frequency sets and assign one set to each group of cells, then how many users could be supported?
  - (b) State and explain various cell types used in cellular network to form hierarchal 07 infrastructure.

### OR

- Q.3 (a) Explain the significance of Signal to Interference Ratio (SIR) on achievable 07 performance of cellular network. Consider two base stations BS<sub>1</sub> and BS<sub>2</sub> with same transmitted power (say P<sub>T</sub>). A mobile terminal is located at a distance of d<sub>1</sub> from BS<sub>1</sub> and d<sub>2</sub> from BS<sub>2</sub> and connecting through BS<sub>1</sub>. Give an expression to calculate the SIR on the said mobile terminal from BS<sub>2</sub> while it is connected to BS<sub>1</sub>.
  - (b) Explain mobility management mechanism in IP network with suitable block 07 diagram and necessary control message flow.
- Q.4 (a) Explain in detail the multiple access schemes adopted in GSM network. 07
  - (b) State and explain various forward links used in CDMA based IS-95 07 communication system.

### OR

Q.4	(a) (b)	With the help of a suitable diagram explain GPRS architecture. Explain logical model of Wireless Protocol Application (WAP) environment.	07 07
Q.5	(a)	Explain various issues involved in designing routing protocol for AdHoc Networks.	07
	<b>(b)</b>	What do you understand by scheduling in WiMAX Network? State and explain various service classes of WiMAX network.	07
		OR	
Q.5	(a)	Why does the CSAM/CD protocol cannot be used in IEEE 802.11 network as MAC layer protocol? Explain briefly. State and explain the MAC protocol for IEEE 802.11 network.	07

(b) Describe active and passive mode of data gathering in Geo Location System.
07 Include data collection mode and underlying technology in your discussion.

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