

GUJARAT TECHNOLOGICAL UNIVERSITY**ME- SEMESTER II- EXAMINATION – SUMMER 2015****Subject Code: 2720502****Date: 28/05/2015****Subject Name: Wireless and Mobile Communication****Time: 2:30 PM – 5:00 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 concept of diversity. Also explain Time diversity, Frequency diversity and Space diversity techniques. **07**
- (b) Distinguish between AWGN channel, Rayleigh fading channel and Rician fading channel in a wireless environment. What are the distinct applications of Rayleigh and Rician channel modeling in wireless communications? **07**
- Q.2** (a) If signal to interference ratio of 15db is required for satisfactory forward channel performance of a cellular system, what is the frequency reuse factor and cluster size that should be used for maximum capacity if the path loss exponent are $n = 4$ and 3 ? Assume that there are 6 co-channel cells in the first tier and all of them are at the same distance from mobile. Use suitable approximations. **07**
- (b) Define channel assignment. Differentiate between static, borrowing and dynamic channel assignment strategies. **07**
- OR**
- (b) Explain how hand-off takes place in GSM. Also explain MAHO, Intersystem hand-off and prioritizing handoffs. **07**
- Q.3** (a) Explain the difference between co-channel interference and adjacent channel interference. Derive the equation for the signal to interference ratio. **07**
- (b) Explain impulse response model of a multi path channel with necessary equations. **07**
- OR**
- Q.3** (a) Determine the propagation path loss for a radio signal at 900 MHz cellular system operating in a large urban city with a base station Tx, antenna height of 100 meter and mobile Rx antenna height of 2 m. the mobile unit is located at a distance of 4km. Use the HATA propagation path loss model. **07**
- (b) Explain different types of small scale fading. **07**
- Q.4** (a) What are the types of routing in Mobile Ad-hoc Network? Describe all REACTIVE type of routing protocols in detail. **07**
- (b) Write a short note on features and challenges of MANET. **07**
- OR**
- Q.4** (a) Explain MACA & MACAW protocols for MANETs. **07**
- (b) Explain GPRS technology. **07**
- Q.5** (a) Write a short note on RAKE Receiver **07**
- (b) Explain the space diversity reception methods. **07**
- OR**
- Q.5** (a) Explain MIMO diversity technique and its application in modern wireless communication system. **07**
- (b) Explain OFDM technique in brief and compare traditional FDM and OFDM techniques. **07**