

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-VII(NEW) • EXAMINATION – WINTER 2016

Subject Code:2171004**Date:23/11/2016****Subject Name:Wireless Communication****Time:10.30 AM to 1.00 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)** Define the following terms regarding wireless communication: 7
- (1) Page
 - (2) Full duplex channel
 - (3) Simplex systems
 - (4) Mobile Switching Center
 - (5) Control channel
 - (6) Base station
 - (7) Forward channel
- (b)** What is ZigBee ? Explain in details ZigBee networks. 7
- Q.2 (a)** If 20 MHz of total spectrum is allocated for a duplex wireless cellular system and each simplex channel has 25 KHz RF bandwidth, find:
- (i) The number of duplex channels
 - (ii) The total number of channels per cell site ,if N=4 cell reuse is used.
- (b)** Explain the concept of Cell Splitting and Cell Sectoring. 7
- OR**
- (b)** (i) Explain the concept of Umbrella cell. 7
- (ii) Explain the concept of Frequency Reuse.
- Q.3 (a)** What is fading? List and explain various types of small scale fading. 7
- (b)** With necessary equations explain Free space propagation model in detail. 7
- OR**
- (a)** Prove that for a hexagonal symmetry, the co-channel reuse ratio is given by $Q=(3N)^{1/2}$. Where, $N=i^2+ij+j^2$. 7
- (b)** Enumerate various radio propagation model and explain any two of them. 7
- Q.4 (a)** Explain the following diversity techniques briefly: 7
1. Space diversity techniques
 2. Frequency diversity techniques
- (b)** Describe: Time Division Multiple Access (TDMA) in detail. Write the equation for efficiency of TDMA and The number of channels in TDMA system. 7
- OR**
- (a)** Write short note on Code Division Multiple Access (CDMA). 7
- (b)** Describe evolution of 1G, 2G and 3G mobile phone systems. 7
- Q.5 (a)** Describe in details GSM architecture with necessary block diagram and its various blocks. 7
- (b)** Describe RAKE receiver in CDMA. 7

OR

- (a) What is meant by Hand off and explain different Hand off strategies How handoff operation is performed while mobile moves into a different cell while a conversation is in progress. Discuss the cases for proper and improper handoff situations. **7**
- (b) Explain in brief: (i) Wi - Fi (ii) Wi Max (iii) UWB. **7**
