Seat No.: _____ Enrolment No._____

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**

****