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Total number of printed pages – 2

B. Tech  
PEEC 5302

## Sixth Semester (Special/Back) Examination – 2013

### MOBILE COMMUNICATION

BRANCH : EC, ETC

QUESTION CODE : E 383

Full Marks – 70

Time : 3 Hours

Answer Question No. 1 which is compulsory and any **five** from the rest.

The figures in the right-hand margin indicate marks.

1. Answer the following questions : 2×10
- (a) What is meant by hand-off interval and hand-off region ?
  - (b) Distinguish between 3G and 4G.
  - (c) The system capacity increases by decreasing the cluster size. Is it true ? Explain.
  - (d) What is role of an equalizer in a receiver of a wireless communication system ?
  - (e) What do you mean by dynamic channel assignment ?
  - (f) Mention the basic propagation mechanisms which impact propagation in mobile communication.
  - (g) What is fast fading and slow fading ?
  - (h) A transmitter produces 80 w power .Express the power in dBm and dBw.
  - (i) Why the cells are chosen hexagonal in shape ?
  - (j) Define GOS and trunking efficiency.
2. (a) Briefly describe Okumura model. 5
- (b) Distinguish between TDMA and FDMA with a neat sketch bringing out silent features. 5

P.T.O.

3. (a) Explain various channel assignment strategies for a cellular system. 4  
 (b) Explain the least mean square algorithm for adaptive equalization. 6
4. A receiver in an urban cellular radio system detects a 1 mW signal at  $d = d_0 = 1$  meter from the transmitter. In order to mitigate co-channel interference effects, it is required that the signal received at any base station receiver from another base station transmitter which operates with the same channel must be below -100 dBm. A measurement team has determined that the average path loss exponent in the system is  $n = 3$ . Determine the major radius of each cell if a seven-cell reuse pattern is used. What is the major radius if a four cell reuse pattern is used? 10
5. (a) Explain the FM demodulator using a slope detector. 5  
 (b) If the mobile is moving at a 60 km/hr and the frequency is 900 MHz. What will be the Doppler spread? 5
6. (a) Explain the different parameters of mobile multipath channels. 5  
 (b) If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if the system uses 7 cell reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell. 5
7. (a) What role does "SECTORIZATION" of a cell area have on the performance of a Cellular system? Explain what is Sectorization. 5  
 (b) Explain what is meant by Diversity Reception. What are the different types? What are its advantages in Cellular communication? 5
8. Write short notes on any **two** of the following : 5×2  
 (a) FHMA  
 (b) Adaptive equalizer  
 (c) Small scale fading  
 (d)  $\pi/4$  QPSK detection technique.

