6/5/13 L2B

R09

Code No: 09A80401

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year II Semester Examinations, May - 2013

Cellular and Mobile Communications

(Common to ECE, ETM)

Time: 3 Hours **Max. Marks: 75**

Answer any Five Questions
All Questions Carry Equal Marks

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1.a) List the significant improvements introduced in the first, second and third generation standards of cellular communication systems.

b) What does a small delay spread indicate about the characteristics of a fading channel? If the delay spread in 1 microsecond, will the two different frequencies that are 1 MHz apart, experience correlated fading? [7+8]

2.a) How does frequency reuse increase spectrum efficiency in a cellular system? Explain it with the help of suitable example which compares a cellular mobile system with a conventional mobile system.

b) Consider that a geographical area of a cellular system is 4800 km^2 A total of 1001 radio channels are available for handling traffic. Suppose the area of a cell is 12 km^2. How many times would the cluster of size 7 have to be replicated in order to cover the entire service area? Calculate the number of channels per cell and the system capacity. [7+8]

3.a) Define co-channel cell and co-channel interference. How does co-channel interference become a serious concern in the design of a cellular mobile system?

b) Distinguish between space and frequency diversity techniques. Describe the space diversity combining technique. [7+8]

4.a) What is adjacent channel inference? Explain its influence on the channel capacity.

b) Explain the merits of Lee model. [7+8]

5.a) Discuss the influence of flat and hilly terrain on the channel capacity.

b) Explain the mobile propagation over water and flat open area. [7+8]

6.a) Show that lowering the cell-site antenna height on the hill does not reduce the received signal power at the mobile unit.

b) How does the directional antenna reduce interference? Explain. [7+8]

7.a) Explain how different channel allocation strategies maintain the frequency reuse distances, while borrowing channels from other cells.

b) Explain the forcible-borrowing channel assignment scheme. [7+8]

8.a) Why do we need handoff in a cellular communication system? And explain its advantages.

b) Compare mobile assisted and soft handoff techniques. [7+8]

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