

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B. Tech IV Year I Semester Examinations, November/December - 2016****CELLULAR AND MOBILE COMMUNICATIONS****(Electronics and Communication Engineering)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART- A**(25 Marks)**

1. a) What is Grade of Service? [2]
- b) Define (i) Coherence time (ii) System Capacity [3]
- c) Define cross talk. [2]
- d) Define the terms (i) Polarization and (ii) Directivity of an antenna system. [3]
- e) What is meant by foliage? Define foliage loss [2]
- f) What is the minimum separation required between cell site antennas? Explain briefly. [3]
- g) What is meant by frequency management [2]
- h) Write short notes on sectorization. [3]
- i) What is meant by hand-off and handoff algorithm [2]
- j) Explain the concept of delaying handoff in brief. [3]

PART-B**(50 Marks)**

2. What are the various techniques used to expand the capacity of a cellular system? Explain any two. [10]

OR

3. a) Derive C/I from a normal case in a omnidirectional antenna system. [5+5]
- b) Write the advantages and disadvantages of 1G and 2G cellular systems. [5+5]
4. a) Determine the signal to co-channel interference ratio at the mobile receiver located at the boundary of its omnidirectional operating cell, under the influence of interfering signals from six co-channel interfering cells in the first tier in a cellular system designed with i) $N=4$ and ii) $N=7$. Assume path loss exponent is 4. [6+4]
- b) Write short notes on Adjacent channel interference. [6+4]

OR

5. a) Write short notes on: i) space diversity ii) Time diversity. [5+5]
- b) Discuss how antenna height effects the coverage and interference of cellular system. [5+5]
6. a) Discuss the merits of point to point model. [5+5]
- b) Explain the effect of propagation of mobile signals over water. [5+5]

OR

- 7.a) Explain umbrella antenna patterns in detail.
b) Explain in detail about long-distance propagation. [5+5]
- 8.a) Differentiate between FCA and non-FCA in detail.
b) Explain how the 666 channels are dividing into groups. [5+5]

OR

- 9.a) Explain the following: i) channel barrowing ii) overlaid cells.
b) Explain the channel assignment to the mobile units in detail. [5+5]
- 10.a) What are the various handoff initiation techniques? Explain any two in brief.
b) Write short notes on: i) Mobile assisted handoff ii) soft handoff [5+5]
- 11.a) How can handoff be initiated at the boundary of two cells, based upon threshold point considering signal at two base stations.
b) What is meant by a dropped call? What are the factors that influence the dropped call rate? [5+5]

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