R13

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, March - 2017
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) Mention the limitations of conventional mobile telephone systems. [2]
   b) Discuss the dependence of frequency reuse distance on cell reuse pattern. [3]
   c) Explain polarization diversity. [2]
   d) Mention the effect on coverage and interference of mobile link by decrease in transmitted power level. [3]
   e) List the antennas used for space diversity. [2]
   f) State the factors on which the minimum separation of cell site antennas depends. [3]
   g) List any three techniques for increasing frequency spectrum utilization. [2]
   h) Define spectrum utilization factor. [3]
   i) Explain the need for hand off. [2]
   j) Define intersystem hand off. [3]

Part-B (50 Marks)

2. Explain the steps involved in planning a cellular system. Illustrate how the performance criteria is evaluated. [10]

OR

3. Explain briefly different ways of improving coverage and capacity in cellular systems. [10]

4. Determine the real time co-channel interference measurement of mobile radio transreceivers. [10]

OR

5. Explain the near field and far field interference and how to avoid it. [10]

6. Let a distance between two fixed stations be 40 Km. The effective antenna height at one end h_1 is 200m above sea level. Find h_2 at the other end so that the received power always meets the condition Pr<Po (the received power is less than received power in free space) at 850 MHz transmission. Find the range of h2 which would keep Pr>Po and find the maximum received power Pr for Pr=4Po. [10]

OR

7. Derive the path loss prediction model in non obstructive condition. [10]

8.a) Describe in detail the adjacent channel assignment using omni-directional and directional antennas.
   b) Explain how channel sharing and borrowing is performed.
   c) Compare omni and sectorized cells for seven cell system in fixed channel assignment.

                                                                                    [4+2+4]

OR

9. Illustrate the frequency management chart and spectrum allocation for 666 channels and discuss the functions of set up and voice channels.   [10]

10. Explain about:
   a) Dropped calls
   b) Mobile assisted hand off
   c) Soft hand off.   [10]

OR

11. Explain in detail the need for hand off and determine the probability of requirement of hand off.   [10]

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