

R13**Code No: 117BG****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 $P_r < P_o$ (the received power is less than received power in free space) at 850 MHz transmission. Find the range of h_2 which would keep $P_r > P_o$ and find the maximum received power P_r for $P_r = 4P_o$. [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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