

R13

Code No: 117BG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, April/May - 2018

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 are the advantages of cellular systems over conventional telephone systems? [2]
- b) What is Co-channel Interference Reduction Factor? [3]
- c) Define the gain of an antenna and write the expression for it. [2]
- d) Explain the advantages of cell sectorization over cell splitting. [3]
- e) What is the difference between long term and short term fading? [2]
- f) Define the General formula for noise limited system. [3]
- g) What is meant by channel assignment? [2]
- h) What is grouping? [3]
- i) What are the different types of handoffs? [2]
- j) Define a dropped call rate and explain how it differ from blocked call? [3]

PART-B

(50 Marks)

- 2.a) List the various techniques used to expand the capacity of a cellular system. Explain in detail.
- b) Explain how co-channel interference is measured in real time mobile radio transceivers. [5+5]

OR

- 3.a) Explain delay spread, coherence bandwidth and amplifier noise in mobile radio environment.
- b) What do you mean by desired C/I? Explain. [5+5]

4. Derive the expression for carrier-to-interference ratio in a cellular system for normal case and worst-case scenario with an omni-directional antenna. [10]

OR

5. Draw the setup for space diversity antennas used at cell site and explain how to design it. [10]

- 6.a) Explain the effects of human made structures on mobile propagation.
- b) What are the different types of antennas used for mobile station? Explain anyone. [5+5]

OR

7. From the free space propagation model derive the equation for received power. [10]

8.a) Briefly discuss the channel sharing and borrowing.

b) Explain the channel assignment to the cell sites based on the adjacent channels. [5+5]

OR

9.a) Describe the grouping of the voice, set-up and paging channels.

b) Explain in detail the non-fixed channel assignment. [5+5]

10. Define the dropped call rate and obtain the expression for it. [10]

OR

11.a) Explain the following terms:

i) Forced Handoff ii) Hard Handoff iii) Delaying Handoff

b) Explain how the handoffs implemented based on signal strength. [5+5]

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