

Code No: 127BG

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD

B. Tech IV Year I Semester Examinations, November/December - 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 3G cellular systems over 2G systems? [2]
- b) Define (i) Coherence Bandwidth (ii) Doppler spread [3]
- c) What are the components in a cellular system? [2]
- d) Discuss in brief how power effects the coverage of the cellular system. [3]
- e) State the major factors causing propagation pathloss. [2]
- f) Why there is constant standard deviation along the pathloss curve. [3]
- g) What is the significance of Access channels in a cellular system? [2]
- h) Explain how set-up channels act as control channels in a cellular system. [3]
- i) What are the advantages of hand-off process? [2]
- j) Explain the concept of intersystem handoff in brief. [3]

## PART-B

(50 Marks)

- 2.a) Explain the principle of operation of basic cellular mobile system.
  - b) Why do we divide the cell into various sectors? Explain briefly. [5+5]
- OR**
- 3.a) Mention the limitations of conventional mobile telephone systems.
  - b) Describe the frequency reuse concept in cellular communication system and derive the expression for the frequency reuse ratio. [5+5]
- 4.a) What are the different antenna parameters? Explain any four in brief.
  - b) Discuss the effect of near-end and far-end interference of mobile unit in brief. [5+5]
- OR**
- 5.a) Explain how co-channel interference is measured in real time mobile transceiver.
  - b) Write short notes on (i) polarization diversity (ii) frequency diversity. [5+5]
- 6.a) Write short notes on Space diversity antennas.
  - b) Determine the phase difference between direct path and reflected path. [5+5]
- OR**
- 7.a) Explain in detail about near distance propagation.
  - b) Explain the basic principle of operation of mobile antenna. [5+5]

- 8.a) What do you understand by non-FCA? Describe any two algorithms.  
b) Explain the channel assignment to the cell sites based on the adjacent channels. [5+5]

OR

- 9.a) Explain the following (i) channel sharing (ii) paging channel.  
b) A full duplex wireless cellular system is allocated a total spectrum of 20MHz and each simplex channel has 25 KHz RF bandwidth. Determine the following: (i) Total number of full-duplex channels available.(ii)Number of channels per cell site if K=4cell reuse pattern is employed. [5+5]

- 10.a) Explain the necessity of power difference handoff. Also explain the different conditions based on the power difference hand-off.  
b) Define the dropped call rate. How dropped calls are considered. Explain. [5+5]

OR

11. What are the different types of handoffs? Explain their implementation in brief. [10]

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