

Code No: RT42041

R13**Set No. 1**

IV B.Tech II Semester Regular Examinations, April/May - 2017

CELLULAR MOBILE COMMUNICATION

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

*Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) Explain the concept of Cell splitting [3]
- b) What is Co-channel Interference Reduction Factor [4]
- c) Roof mounted antennas. [3]
- d) Compare the Omni cells and sectorized cells [4]
- e) What is the commonly used formula for interference limited system. [4]
- f) What are main subsystems of GSM architecture? [4]

PART-B (3x16 = 48 Marks)

2. a) Describe the digital cellular land mobile systems and the limitations of AMPS standard. [8]
- b) During a busy hour the no. of calls per hour Q_i for each 10 cells is 2000, 1500, 3000, 500, 1000, 1200, 1800, 3200, 2600, 800. Assume that 60% of the car phones will be used during this period and that one call is made per car phone. Find the no. of customers in the system. [8]
3. a) Explain the effects of Antenna parameters in designing cellular system. [8]
- b) Draw the setup for space diversity antennas used at cell site and explain how to design it. [8]
4. a) Explain about High gain antennas [8]
- b) Discuss about the minimum separation of cell site antennas? [8]
5. a) Write about fixed channel assignment schemes in detail. [10]
- b) Explain about paging channels. [6]
6. a) Explain the following terms: i) Mobile Assisted Handoff ii) Soft Handoff
iii) Delaying Handoff iv) Cellsite Handoff [8]
- b) What are the different factors that limit the size of splitting cells? [8]
7. a) Discuss some of the reservation based multiple access protocols for wireless networks, with suitable illustrations. [8]
- b) What are the channel types of GSM system? Explain [8]

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R13**Set No. 2****IV B.Tech II Semester Regular Examinations, April/May - 2017****CELLULAR MOBILE COMMUNICATION****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) What is the difference between long term and short term fading. [4]
- b) Explain real time Co- Channel interference. [3]
- c) Explain vertically oriented mobile antennas. [3]
- d) What are the advantages of sectorized cells? [4]
- e) Define the General formula for noise limited system. [4]
- f) What are the channel types of GSM system? [4]

PART-B (3x16 = 48 Marks)

2. a) Differentiate the analog & digital cellular systems with their operating capacities. [8]
- b) Mention the two frequency reuse schemes and explain N-Cell reuse pattern in detail for four & seven cell reuse with illustrative diagrams. [8]
3. a) Explain ground incident angle, elevation angle, ground reflection and reflection point with respect to signal coverage. [8]
- b) From the free space propagation model derive the equation for received power. [8]
4. a) Explain about Umbrella pattern antennas [8]
- b) Explain space diversity antennas. [8]
5. a) Discuss the concept of frequency management concern to the numbering the channels and grouping into the subset. [8]
- b) Write the concept of the self location scheme at the mobile unit and the autonomous registration. [8]
6. a) Explain how the handoffs implemented based on signal strength? [8]
- b) Explain the following terms:
i) Forced Handoff ii) Hard Handoff iii) Delaying Handoff [8]
7. a) Discuss the salient features of FDMA and TDMA techniques. [8]
- b) With suitable block diagram explain the GSM system. [8]

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R13**Set No. 3****IV B.Tech II Semester Regular Examinations, April/May – 2017****CELLULAR MOBILE COMMUNICATION****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) What are the limitations of conventional mobile telephone system [3]
b) Explain the phase difference between direct and reflected paths [3]
c) Explain horizontally oriented mobile antennas. [4]
d) Explain about paging channels. [4]
e) Define Handoff. What are the different types of handoffs? [4]
f) What are the interfaces used in the GSM? [4]

PART-B (3x16 = 48 Marks)

2. a) Explain the significance of following cellular concepts in detail [8]
i) Interference ii) System Capacity
b) If the maximum no of calls per hour Q_i in one cell be 5000 and an average calling time T be 1.76 min. The blocking probability is 2%. Find the offered load. If Q_i is 30000. Find the offered load compare this with no. of channels by using Erlang B model charts. [8]
3. a) Explain the designing of the directional antenna, for $k=4$, $k=12$ and $k=7$ with all suitable values explaining each of them, consider a noise margin of 6dB. [8]
b) With neat sketch explain about Signal reflections in flat and hilly terrain. [8]
4. a) Draw the symmetrical difference pattern and compare it with symmetrical sum pattern. [8]
b) Explain about Umbrella pattern antennas. [8]
5. a) What are the different techniques to utilize the frequency spectrum, give a brief explanation? [8]
b) Explain in detail access channels and operational techniques. [8]
6. Write short notes on the following [16]
(a) Cell splitting
(b) Vehicle locating methods
(c) Dropped cell rate
7. a) Why CDMA is needed and explain it with an example? [8]
b) List the difference between TDMA/FDMA/CDMA. [8]

Code No: **RT42041****R13****Set No. 4****IV B.Tech II Semester Regular Examinations, April/May – 2017****CELLULAR MOBILE COMMUNICATION****(Electronics and Communication Engineering)****Time: 3 hours****Max. Marks: 70***Question paper consists of Part-A and Part-B**Answer ALL sub questions from Part-A**Answer any THREE questions from Part-B*

PART-A (22 Marks)

1. a) Explain the different parts of basic cellular system [3]
b) Define frequency reuse distance [3]
c) Draw the antenna equivalent circuit [4]
d) Explain about access channels. [4]
e) Define a dropped call rate and explain how it differ from blocked call? [4]
f) What is BCCH and CCCH? [4]

PART-B (3x16 = 48 Marks)

2. a) Explain delay spread, coherence bandwidth and amplifier noise in mobile radio environment. [8]
b) Explain how co-channel interference is measured in real time mobile radio transceivers. [8]
3. a) Explain about the co-channel interference reduction factor and derive the general formula for C/I. [8]
b) Briefly explain about multiple knife edge diffraction. [8]
4. a) Explain Sum and difference patterns and their synthesis. [8]
b) Explain the role of directional antennas for interference reduction. [8]
5. a) What do you understand by non-fixed channel assignment? Describe the corresponding algorithms. [8]
b) Explain about the Underlay-Overlay Arrangement. [8]
6. a) What are the different types of handoffs? Explain how to implement them? [8]
b) How the dropped call rate is related to the capacity and voice quality. [8]
7. a) Explain about the TDMA. [8]
b) With suitable block diagram explain the GSM system. [8]