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

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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 Qi 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]

Code No: **RT42041** **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

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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]

Code No: **RT42041** **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

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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
      i) Interference ii) System Capacity [8]
   b) If the maximum no of calls per hour Qi 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 Qi 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

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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 spared, 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]