Code No: 07A70404 | **R07** | **Set No. 2**

IV B.Tech I Semester Examinations,December 2011
CELLULAR AND MOBILE COMMUNICATIONS
Common to Electronics And Computer Engineering, Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. Discuss in detail point-to-point path loss prediction model. Discuss the factors that effect the accuracy of prediction. [16]

2. (a) Draw the symmetrical sum pattern, symmetrical difference pattern and null free pattern and compare them.

   (b) Draw the directional antenna configuration for 120^0 sector (90 channels) and explain how interference is reduced? [8+8]

3. (a) Explain how a one setup channel is used for both paging and access?

   (b) What are the sectorization methods of the cell configuration?

   (c) How a call is assigned to underlaid/overlaid cells? [6+6+4]

4. (a) Discuss the amplifier noise in cellular frequency band and derive the expression for noise figure.

   (b) Explain the operation of a cellular system in detail. [6+10]

5. (a) Explain how a mobile handoff message can align a time in TDMA Digital Cellular System?

   (b) How many channels are there in TDMA Digital Cellular System? What type of functions are performed by them? [8+8]

6. (a) Explain the effect of umbrella pattern antennas?

   (b) How the use of parasitic elements give the reduction in cochannel interference? Explain. [8+8]

7. (a) For a cellular system, If blocking probability is 40% and assuming each subscriber generates 0.1 Erlangs traffic load, find the no. of. subscribers if no. of. channels are

      i. 1
      ii. 5
      iii. 10
      iv. 20
      v. 100. Use Erlang B model charts.

   (b) In a total 33MHz of BW allocated to a particular FDD system which uses two 25kHZ simplex channels to provide full duplex voice & control channels. Compute the no. of channels available per cell if a system uses:

1

i. four cell reuse

ii. seven cell reuse

iii. 12 cell reuse.

1 MHz of allocated spectrum is dedicated to control channels. Determine a equitable distribution of control & Voice channels in each cell for each of three systems. [8+8]

8. (a) What type of handoff is used when a call initiated in one cellular system and enter another system before terminating? Explain how it works.

(b) Explain how the coverage is increased for a noise-limited system by the parameters of the system. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: 07A70404 | R07 | Set No. 4

IV B.Tech I Semester Examinations,December 2011
CELLULAR AND MOBILE COMMUNICATIONS
Common to Electronics And Computer Engineering, Electronics And
Telematics, Electronics And Communication Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain about foliage loss in detail.

   (b) Discuss the merits of point-to-point model.   [8+8]

2. (a) Explain how the handoffs implemented based on signal strength?

   (b) How the dropped call rate is related to the capacity and voice quality.

   (c) What are the different factors that limit the size of splitting cells?   [6+4+6]

3. (a) Explain the inefficient spectrum utilization based on the existing mobile systems MTS & IMTS.

   (b) Explain the history of 800MHz spectrum allocation to cellular systems. [8+8]

4. (a) Explain how setup channels are act as control channels in a cellular system ?

   (b) Explain the Forcible-borrowing channel assignment Algorithm and how to implement it?   [8+8]

5. (a) Distinguish between permanent splitting and dynamic splitting.

   (b) From a Normal case, Derive the desired C/I in an omni directional antenna system.   [8+8]

6. (a) Draw the symmetrical sum pattern and compare it with symmetrical difference pattern.

   (b) Draw the directional antenna configuration for 120^0 sector (45 channels) and explain how interference is reduced?   [8+8]

7. (a) Prove that k=7 cell pattern does not provide a sufficient frequency reuse distance even when ideal conditions of flat terrain is assumed.

   (b) Explain how location, height and configuration of antennas are selected in a base station, to avoid cochannel interference.   [10+6]

8. (a) Why HLR and VLR are required in Network and Switching subsystem? Differentiate them.

   (b) What are the different types of logic channels? How these are differ from physical channels?   [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

3

Code No: 07A70404 $\boxed{\textbf{R07}}$ $\boxed{\textbf{Set No. 1}}$

IV B.Tech I Semester Examinations,December 2011
CELLULAR AND MOBILE COMMUNICATIONS
Common to Electronics And Computer Engineering, Electronics And
Telematics, Electronics And Communication Engineering
Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Distinguish between signal and co-channel interference received by the mobile unit and cell site.
   (b) Explain the importance of the antenna height in reduction of co-channel interference. [8+8]

2. (a) Explain the working of Base station subsystem in GSM.
   (b) Draw the block diagram of OSS organization and explain each block. [8+8]

3. (a) What is the function of frequency management and how channel assignment is performed?
   (b) What are the different types of fixed channel assignment to the cell sites? Explain them. [8+8]

4. (a) Determine the transfer function of the propagation channel in mobile-to-mobile propagation.
   (b) If h_1 =110m use approximate method to find incident angle, elevation angle, ground reflection and reflection point. [8+8]

5. (a) Distinguish between the landline telephone network and cellular telephone network.
   (b) Explain about NMT & NTT Systems. [8+8]

6. (a) Why the handoffs are needed in cell sites?
   (b) What are the advantages of delayed handoffs?
   (c) What are the reasons for perception of dropped call rate by the subscribers can be higher? [6+6+4]

7. (a) Give the general formula to find the value of 'K' and find out the frequency reuse distance with available 'K' value.
   (b) What is the concept of frequency reuse and explain how this is useful in increasing the no. of. channels. [6+10]

8. (a) Differentiate between Roof-mounted and Glass mounted antennas.
   (b) Explain horizontally oriented and vertically oriented space diversity antennas. [8+8]

⋆ ⋆ ⋆ ⋆

4

Code No: **07A70404** | **R07** | | **Set No. 3** |

IV B.Tech I Semester Examinations,December 2011
CELLULAR AND MOBILE COMMUNICATIONS
Common to Electronics And Computer Engineering, Electronics And
Telematics, Electronics And Communication Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Explain the terms GSM & GPS.
   (b) Write notes on Digital cellular systems.   [8+8]

2. (a) Explain how the groups of the 666 channels are divided into subsets?
   (b) Compare the functioning of access and paging channels.   [8+8]

3. (a) Explain the synthesis of difference patterns.
   (b) Draw the setup for space diversity antennas used at cell site and explain how
       to design it.   [8+8]

4. (a) What are the different switching functions included in Network and Switching
       subsystem of GSM? Explain them briefly.
   (b) What are the different Authentication parameters for base station validation
       in CDMA Digital Cellular Systems and explain them?   [8+8]

5. (a) What is the significance of the sampling delay time Δt concerned to the real
       time co channel interference measurement.
   (b) Explain the importance of notch in the tilted antenna pattern to reduce the
       co-channel interference.   [8+8]

6. (a) Explain how a two level handoff scheme is used to eliminate the interference
       in the system?
   (b) Determine the transmitted power for a new cell after cell splitting.   [8+8]

7. (a) Derive the relation for the maximum coverage distance in mobile environment.
   (b) Derive the relation for path loss in land to mobile over water.   [8+8]

8. (a) Explain the patterns of cell splitting and types of cell splitting.
   (b) Derive C/I in an omni directional antenna system for k = 7 frequency reuse
       pattern.   [8+8]

⋆ ⋆ ⋆ ⋆ ⋆