Code No: L0401/R05 **Set No. 1**

IV B.Tech II Semester Regular Examinations, April 2010
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Discuss analog cellular system (AMPS) in detail.
   (b) Discuss the special features in AMPS and compare them with Digital cellular systems. [8+8]
2. (a) Explain the components of cellular systems.
   (b) Explain the frequency reuse distance in cellular radio system. [8+8]
3. (a) Write notes on power control and diversity receiver.
   (b) Explain the different types of Noncochannel interference. [10+6]
4. (a) Prove that in two ray ground model $\Delta=d_1-d_2 \cong 2h_t h_r/d$ and state the condition for above expression to present a good approximation.
   (b) Consider a transmitter which radiates a sinusoidal carrier frequency of 1850 MHz, For a vehicle moving at 90kmph. Compute the received carrier frequency if the mobile is moving in a
      i. Direction towards the transmitter.
      ii. Direction away from the transmitter
      iii. Direction, which is perpendicular to the direction of the arrival of the transmitting signal. [10+6]
5. (a) What are the different synthesis of sum pattern? Explain them briefly.
   (b) What are the antennas used at cellsite? Explain them. [8+8]
6. (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]
7. (a) Why the handoffs are needed in cell sites?
   (b) What are the advantages of delayed handoffs?
   (c) What ate the reasons for perception of dropped call rate by the subscribers can be higher? [6+6+4]
8. (a) What are the types of common channels of GSM? Explain how they are used?
   (b) Draw and explain the forward CDMA channel structure. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: L0401/R05 **Set No. 2**

IV B.Tech II Semester Regular Examinations, April 2010
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) What are the limitations of conventional mobile telephone systems? How are they overcome by cellular systems?
   (b) Why Hexagonal-shaped cells are used in cellular system. [10+6]
2. (a) Discuss the handoff mechanism by using cochannel interference reduction ratio q.
   (b) Describe about desired C/I from a normal care in an omnidirectional antenna system. [8+8]
3. (a) Explain how co-channel interference is measured in real time mobile radio transceivers.
   (b) Explain different methods to reduce the cochannel interferences. [8+8]
4. (a) Determine the phase difference between direct path and reflected path.
   (b) Explain mobile propagation through obstructive path. [8+8]
5. (a) Write the equation of general pattern for a 2N elements array equi-spaced by a separation 'd'.
   (b) Differentiate between Roof-mounted and glass-mounted antennas.
   (c) What are the advantage of using umbrella pattern antennas at cell site? [4+6+6]
6. (a) What is the difference between frequency management and channel assignment?
   (b) What are the methods used to increase the traffic capacity at an omni directional cell? Explain them. [8+8]
7. Write the general formula for call dropped rate and mention the specific conditions for the interference limited system. Prove that the call dropped rate is totally depends on the interference. [16]
8. (a) Explain the significance of SIM in Mobile station.
   (b) What is the function of transcoder rate adoption unit in BSS?
   (c) What are the different kinds of downlink common channels? [6+4+6]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: L0401/R05 **Set No. 3**

IV B.Tech II Semester Regular Examinations, April 2010
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Differentiate the analog & digital cellular systems with their operating capacities.
   (b) Explain the relation between the received power & the range of subsystem in detail. [8+8]
2. (a) What do you mean by desired C/I? Explain.
   (b) Derive the expression for cochannel interference reduction factor. [6+10]
3. (a) Write notes on power control and diversity receiver.
   (b) Explain the different types of Noncochannel interference. [10+6]
4. (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]
5. (a) What are the different synthesis of sum pattern? Explain them briefly.
   (b) What are the antennas used at cellsite? Explain them. [8+8]
6. (a) Explain how a paging channels are used for the land originating calls?
   (b) How a Reuse-partition scheme reduces the number of cell sites? Explain it with suitable examples. [8+8]
7. (a) Write notes on power difference handoffs.
   (b) Explain a two level handoff scheme with suitable example. [8+8]
8. (a) Draw the external environment of the BSS and explain its functioning in GSM.
   (b) Explain the call process of Mobile Station in CDMA system. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: L0401/R05 **Set No. 4**

IV B.Tech II Semester Regular Examinations, April 2010
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 hours **Max Marks: 80**

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Discuss in detail the planning of a cellular system.
   (b) Explain about marketing image of hexagonal cells. [10+6]
2. (a) Explain about cochannel inference reduction factor.
   (b) During a busy hour, the number of calls per hour Qi for each of 10 cells is 1000, 1200,1500, 200, 1000, 600, 1800, 2000, 2800, 900. Assume that 50% 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. [10+6]
3. (a) Explain Co-Channel interference which effects at a cochannel cell site.
   (b) Discuss space & frequency diversity schemes. [8+8]
4. Discuss in detail the various factors affecting the mobile radio communication medium with appropriate figures & graphs. [16]
5. (a) What type of antennas are used for coverage and interference reduction? Explain them.
   (b) Explain how umbrella pattern antennas are used as the cell site antennas. [9+7]
6. (a) Differentiate between the Access channel and Paging channel.
   (b) Explain how to avoid interference between two system while assigning setup channels?
   (c) Why the cochannel interference is avoided easily in sectorization than in cell splitting? [6+4+6]
7. (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]
8. (a) What are the different types channels present in GSM? Explain them in detail and discuss their function in GSM.
   (b) What type of modulation is used in TDMA Digital Cellular system? What are the advantages of it? [10+6]

⋆ ⋆ ⋆ ⋆ ⋆