Code No: N0422/R07 **Set No. 1**

IV B.Tech I Semester Supplementary Examinations, December 2013
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Describe the performance criteria of a mobile communication systems.
   (b) Discuss the propagation attenuation and severe fading in a mobile radio transmission medium. [8+8]
2. (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]
3. (a) Give the differences between next channel interference and neighboring channel interference.
   (b) Explain the occurrence of near-end-far-end interference in one cell and two cell system. [8+8]
4. (a) Explain the general formula of received power from real model based on shadow case, direct path & over the water condition in detail.
   (b) Briefly explain the effect of foliage loss in mobile signal propagation. [8+8]
5. (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]
6. (a) What is self location scheme? Why it is used in cellular system?
   (b) Explain how a underlay-overlay cells are arranged in sectorized cells?
   (c) Explain how the channels are assigned in a directional antenna cell system? [4+6+6]
7. (a) Determine the probability of requiring a handoffs in the cell site?
   (b) How to calculate the velocity of the mobile unit?
   (c) Define a forced Handoff and how to create and control it. [6+4+6]
8. (a) What are five downlink channels used in GSM? How these are differ from uplink channels?
   (b) Explain how a Mobile Station adjust the output power in transmission mode of a CDMA DCS. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: N0422/R07 **Set No. 2**

IV B.Tech I Semester Supplementary Examinations, December 2013
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) How the frequency spectrum is utilized efficiently in mobile system? Explain in detail with the suitable example.
   (b) What is the difference between frequency selective fading & flat fading? [10+6]
2. (a) Discuss in detail the Hand off mechanism.
   (b) Compare interference from first tier of six interferers with that from twelve interfereres of second tier. [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. What are the three methods used to increase the traffic capacity in the cell? Explain them in detail. [16]
7. (a) Write notes on vehicle-locating methods.
   (b) What is a forced Handoff? Why it is used?
   (c) What is the relation between capacity, voice quality and dropped call rate? [6+6+4]
8. (a) Why HLR and VLR are required in Network and Switching subsystem? Differentiate them.
   (b) What the different types of logic channels? How these are differ from physical channels? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: N0422/R07 **Set No. 3**

IV B.Tech I Semester Supplementary Examinations, December 2013
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Describe the model of the mobile transmission medium and fading characteristics and discuss in detail.
   (b) Explain coherence bandwidth and delay spread. [10+6]
2. (a) What do you mean by desired C/I? Explain.
   (b) Derive the expression for cochannel interference reduction factor. [6+10]
3. (a) A base station receiver capable of providing 90 dB of isolation between channels is receiving a signal from a mobile unit 3KM away. What is the minimum distance that a second mobile unit can transmit the signal from near end mobile unit.
   (b) Distinguish between co-channel and Noncochannel interference. [8+8]
4. (a) Describe point-to-point prediction model.
   (b) Derive the equation for received power between fixed stations. [8+8]
5. (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]
6. (a) What is meant by channel assignment?
   (b) Compare omni directional and directional antenna cellular systems w.r.t. channel assignment.
   (c) Explain the channel borrowing and channel sharing schemes. [4+6+6]
7. (a) Plot the signal strength for a two level handoff scheme and explain it.
   (b) Derive the commonly used formula of dropped call rate and explain the significance of each term. [8+8]
8. (a) Draw and explain the time organization of a TACH/F.
   (b) Explain why the numbering of the uplink slots is derived from the downlink slots by a delay of 3 time slots?
   (c) What is the compensation time for the propagation delay in sending to the mobile station via SACCH? [6+6+4]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: N0422/R07 **Set No. 4**

IV B.Tech I Semester Supplementary Examinations, December 2013
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communication Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

⋆ ⋆ ⋆ ⋆ ⋆

1. (a) Describe the model of the mobile transmission medium and fading characteristics and discuss in detail.
   (b) Explain coherence bandwidth and delay spread. [10+6]
2. (a) Explain the concept of frequency reuse channels.
   (b) Explain the maximum no.of frequency channels per cell. [10+6]
3. (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]
4. (a) Describe point-to-point prediction model.
   (b) Derive the equation for received power between fixed stations. [8+8]
5. (a) Draw the symmetrical difference pattern and compare it with symmetrical sum pattern.
   (b) Draw the cell site antenna for omni cells for 45 and 90 channels and 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) How to make a handoffs successful at the cell site?
   (b) Explain how cell splitting is used to prevent dropped calls. [8+8]
8. (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]

⋆ ⋆ ⋆ ⋆ ⋆