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

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communications Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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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) 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) 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) If P_r =12W G_t =0 dB G_r = 0 dB and f_c = 900 MHz. Find P_t in watt at a frequency space distance of 1 KM.
   (b) Derive the expression for received power in dBW. [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) Explain how the channels are assigned in an omni-directional cell system?
   (b) Explain the methods of adjacent channel assignment. [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) Explain the different types of interfaces used to connect the units of Base station subsystem in GSM.
   (b) What is the difference between interface and protocol?
   (c) How many slots are present in TDMA frame and what is the length of each slot? [6+4+6]

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

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communications Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss in detail the planning of a cellular system.
   (b) Explain about marketing image of hexagonal cells. [10+6]
2. (a) What is a Handoff. Describe Hand off mechanism.
   (b) Derive the desired C/I form a Normal case in an omni directional antenna system. [8+8]
3. Explain the following terms used in the cellular system.
   (a) Hand off priority
   (b) Cross talk
   (c) Power control
   (d) umbrella pattern. [4+4+4+4]
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) Define sum and difference patterns of an N element array equi-spaced by a separation 'd'.
   (b) Compare High gain antennas with the directional antenna.
   (c) What are the different types of umbrella pattern antennas used at cell site? [4+6+6]
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) 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 is BSS? Explain its working briefly.

(b) Draw the TDMA frame structure and explain the significance of each slot. [8+8]

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

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communications Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (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]
2. What are the considerations of the components of a cellular system, Explain in detail. [16]
3. (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]
4. Discuss in detail path loss prediction over microcell. [16]
5. (a) Draw the pattern for a directional antenna used for interference reduction and explain how it works.
   (b) How the height and separation of an antenna are related in space diversity antennas used at cell site? Explain. [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. 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) 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]

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

IV B.Tech I Semester Supplementary Examinations, Feb/Mar 2011
CELLULAR AND MOBILE COMMUNICATIONS
(Common to Electronics & Communications Engineering and Electronics & Computer Engineering)

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

Answer any FIVE Questions
All Questions carry equal marks

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1. (a) Discuss the trunking efficiency degradation and compare one carrier/market and other than one carrier per market with necessary graphs.
   (b) Discuss the first order & second order statistics of fading. [8+8]
2. (a) Explain the major elements of cellular mobile radio system.
   (b) Explain the frequency reuse schemes.
   (c) Describe the blocking probability of cellular system. [6+6+4]
3. Discuss in detail the various techniques to measure co-channel interference, prove that real-time co-channel interference measurement is difficult to achieve in practice. [16]
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) Draw the omni directional receiving antenna configuration for 45 channels and explain its coverage.
   (b) Draw the directional antenna configuration for 60^0 sector 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) 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) 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]

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