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

IV B.Tech I Semester Examinations,November 2010
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) 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]
2. (a) Draw & Explain the six effective interfering cells of cell 1.
   (b) Describe the main concept of the handoff mechanism. [8+8]
3. (a) Explain about foliage loss in detail.
   (b) Discuss the merits of point-to-point model. [8+8]
4. (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]
5. (a) Discuss in detail the planning of a cellular system.
   (b) Explain about marketing image of hexagonal cells. [10+6]
6. 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]
7. (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]
8. (a) How many power levels are present in TDMA and What is the output power from transmitting antenna of mobile station?
   (b) Draw the VCELP speech decoder and explain how it is used in TDMA Digital Cellular system. [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

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

IV B.Tech I Semester Examinations,November 2010
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) What are the factors that influence the dropped call rate?
   (b) Write notes on cell site handoff and intersystem handoff? [8+8]
2. (a) What are the subsystems of GSM and explain each briefly.
   (b) Explain the following with respect of GSM channels:
      i. SCH
      ii. FACCH
      iii. FCCH
      iv. BCCH. [6+6+4]
3. (a) In a directional antenna system compare k=4 and k=7 for 60^0 and 120^0 sector case.
   (b) What is SINAD meter? Explain. [12+4]
4. (a) Explain the effects of cellsite antenna height on cell coverage.
   (b) Derive the expression for power received in ground reflected model. [10+6]
5. (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]
6. (a) Give a general view of cellular telecommunications systems.
   (b) Explain the need of cell splitting? Compare and contrast between permanent splotting and dynamic splitting. [8+8]
7. (a) What are the different techniques for increasing frequency spectrum?
   (b) Compare the average blocking in spatially uniform and nonuniform traffic distribution for FCA, BCA and FBCA. [8+8]
8. (a) Distinguish between landline telephone networks and cellular telephone network.
   (b) What are the advantages of mobile radio over the heavily saturated cell based radio channels? What are the factors that effect mobile radio channels? [8+8]

⋆ ⋆ ⋆ ⋆ ⋆

Code No: 07A70404 **R07** **Set No. 1**

IV B.Tech I Semester Examinations,November 2010
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 how the setup channels are classified?
   (b) Explain how channel sharing and borrowing increases the trunking efficiency of channels? [8+8]
2. What are the four subsystems of GSM? Explain them in detail with suitable block diagrams. [16]
3. Explain the following terms used in wireless communications:
   (a) Base Station
   (b) Control Channel
   (c) Forward Control Channel
   (d) Full Duplex Channel System
   (e) Half Duplex Channel System
   (f) Hand off
   (g) Mobile Station
   (h) Mobile Switching Center. [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) Explain about the co-channel interference reduction factor and derive the general formula for C/I.
   (b) If the maximum no of calls per hour Q_i 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 Q_i is 30000. Find the offered load compare this with no. of channels by using Erlang B model charts. [10+6]
6. (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]

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

⋆ ⋆ ⋆ ⋆ ⋆

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

IV B.Tech I Semester Examinations,November 2010
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 near-end-far-end interference of mobile systems.
   (b) Differentiate between subjective and objective test. [8+8]
2. Discuss in detail point-to-point path loss prediction model. Discuss the factors that effect the accuracy of prediction. [16]
3. (a) What is BSS? Explain its working briefly.
   (b) Draw the TDMA frame structure and explain the significance of each slot. [8+8]
4. (a) Why a Handoff is delayed? What are the advantages of it?
   (b) Write notes on leaky feeders. [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) 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]
7. (a) Explain the procedure to select a voice channel.
   (b) How to solve the problem of heavy traffic non uniform pattern in the sites closest to the city? [8+8]
8. (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]

⋆ ⋆ ⋆ ⋆ ⋆