

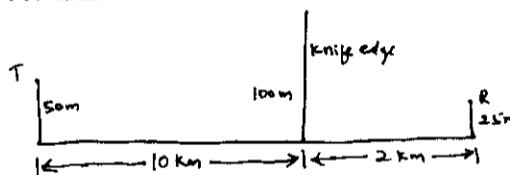
**Second Semester M.Tech. Degree Examination, June / July 2014**  
**Wireless and Mobile Networks**

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions.**

- 1
  - a. Write the timing diagram illustrating how a call initiated by a mobile is established. (10 Marks)
  - b. Explain in detail evolution of Mobile Radio Communication. (10 Marks)
- 2
  - a. Compare Second Generation (2G) with Third Generation (3G) cellular networks. (10 Marks)
  - b. Briefly explain Bluetooth and personal area networks. (10 Marks)
- 3
  - a. With the help of a diagram, illustrate the cellular frequency reuse concept. Demonstrate with a supporting diagram locating co-channel cells for  $N = 19$ , with  $i = 3$  and  $j = 2$ . (10 Marks)
  - b. Illustrate with diagrams, handoff scenario at cell boundary for proper and improper handoff situations. (10 Marks)
- 4
  - a. Prove that for a hexagonal geometry, the co-channel reuse ratio is given by  $Q = \sqrt{3N}$ , where  $N = i^2 + ij + j^2$ . (10 Marks)
  - b. If a transmitter produces 50W of power, express the transmit power in units of i) dBm and ii) dBw. If 50W is applied to a unity gain antenna with a 900 MHz carrier frequency, find the received power in dBm at a free space distance of 100m from the antenna. Assume unity gain for the receiver antenna. (10 Marks)
- 5
  - a. Explain in detail the basic propagation mechanism reflection with supporting diagrams. Also write the equations for reflection co-efficients for the two cases of parallel and perpendicular E – field polarization at the boundary of two dielectrics. (10 Marks)
  - b. Given the following geometry, determine i) the loss due to knife – edge diffraction and ii) the height of the obstacle required to induce 6dB diffraction loss (For 6dB diffraction loss  $V = 0$ ). Assume  $f = 900\text{MHz}$ . (10 Marks)



- 6
  - a. What is Amplitude Modulation? Explain in detail. (10 Marks)
  - b. Briefly explain Binary Phase Shift Keying [BPSK]. Also give the overview of BPSK receiver with carrier frequency circuits. (10 Marks)
- 7
  - a. Distinguish between FDMA and TDMA. (10 Marks)
  - b. Explain packet radio protocols. (10 Marks)
- 8
  - a. Compare wireless telephone networks with fixed telephone networks. (08 Marks)
  - b. Write a note on Minimum Shift Keying (MSK). (06 Marks)
  - c. Briefly explain about the capacity of cellular systems. (06 Marks)

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