



Name :

Roll No. :

Invigilator's Signature :

CS / M.TECH(ECE-COMM) / SEM-2 / MCE-203 / 2012

2012

MOBILE COMMUNICATION

Time Allotted : 3 Hours

Full Marks : 70

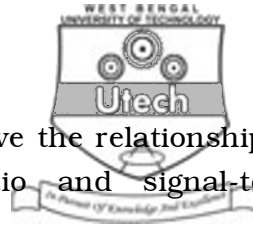
The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer question no. 1 and any *four* questions from the rest.

1. All questions carry equal marks. $7 \times 2 = 14$

- a) What is antenna sectoring ?
- b) Define channel capacity.
- c) What is ISI in context of radio wave propagation ?
- d) Define slow-start.
- e) What is skip-distance ?
- f) Compare between GSM and CDMA.
- g) Is Bluetooth an ad-hoc network ?



2. a) What is frequency reuse ratio ? Derive the relationship between the frequency reuse ratio and signal-to-interference ratio.
- b) Consider 40 MHz is assigned to a cellular mobile network. The system uses two simplex channels of 20 kHz to provide full-duplex voice and control channels. Calculate the number of channels to be assigned per cell for a cluster size of 12.
- c) Consider a cellular system having 2023 duplex channels to cover 1925 sq.km and each cell area is 5 sq.km for 7-cell reuse system. Compute system capacity.
3. a) Using Two-ray ground reflection model, find out the path distance between the line-of-sight and the ground reflection.
- b) A mobile is located 5km away from a base station and uses a vertical $\frac{\lambda}{4}$ monopole antenna with a gain of 2.55 dB to receive cellular radio signals. The E -field at 1 km from the transmitter is measured to be 10^{-3} V/m. The carrier frequency used for this system is 900 MHz.
- (i) Find the length and effective aperture of the receiving antenna.
- (ii) Find the received power at the mobile using Two-ray ground reflection model assuming the height of the transmitting antenna to be 50 m and the receiving antenna to be 1.5 m above the ground.

$$8 + 1 + 1 + 4$$



4. a) With proper diagram describe GSM system architecture.
b) Discuss qualitatively about the logical channels of GSM system. 7 + 7
5. Explain about Wireless Application Protocol (WAP) with diagrams of :
a) WAP Protocol stack
b) WAP Programming model
c) WAP infrastructure. 5 + 4 + 5
6. a) Draw and explain the various fields in a IEEE 802.11 MAC frame format.
b) Explain about IEEE 802.11 Physical layer. 7 + 7
7. a) Give a description of Mobile IP
b) How does mobile IP works ? 7 = 7
-