

[illegible]

Total No. of Questions : 08

Paper ID : [75173]

Max. Marks : 60

2.Each question carries TWELVE marks.

- Q1. a) Why is cell splitting needed? Define 3:1 cell splitting. Explain segmentation in a cellular system. (6)
b) What is the difference between co-channel and adjacent channel interference? List different types of interference reduction techniques. (6)
- Q2 a) Explain the architecture and frame format of GSM system. (6)
b) Discuss the frequency management and channel assignment strategies of GSM system. (6)
- Q3 Define the term multiple access for a communication system. How it is useful in terms of resource allocation? Explain and compare FDMA, TDMA and CDMA on the basis of technical specification, merits, demerits and applications. (12)
- Q4 a) Explain two-ray ground reflection model with proper mathematical expression and diagram. (6)
b) A mobile with receiving antenna of gain 1.8 is located at 7 Km away from a base station transmitter. It uses a vertical $\lambda/4$ monopole antenna with a gain of 3 dB to receive cellular radio signals. The E-field at 1 Km from the base station is measured to be 10^{-3} V/m. The carrier frequency used for this system is 900 MHz. Find the received power at the mobile using two ray ground reflection model assuming the height of the transmitting antenna is 50 m and the receiving antenna is 1.5 m above ground. (6)
- Q5. a) Explain impulse response model of a multipath channel. Define time dispersion parameters (rms delay spread and excess delay spread) of multipath fading channel. How coherence bandwidth depends on time dispersion parameters? (6)

- b) On the basis of different multipath parameters, distinguish between Flat fading, Frequency selective fading. Explain Rayleigh fading model. (6)
- Q6. What is receiver diversity? How diversity is useful in mitigating the effects of fading? With the help of mathematical expressions, explain and compare selection combining and maximal ratio combining? (12)
- Q7. Why CDMA2000 is more efficient and robust than its predecessor (IS95) Compare IS95 and CDMA2000 based on their key physical layer parameters, architecture, channel structure and configuration. (12)
- Q8. Write a short note on : (12)
- a) GPRS.
 - b) LTE and VoLTE.
 - c) Hata channel model.