

Atal Bihari Vajpayee Indian Institute of Information Technology & Management, Gwalior

IT307: Wireless Communication Technologies

Major Examination (Session 2024–25)

Maximum Time: 3 Hours

Max Marks: 55

Note: Attempt any five questions. Support your answers with proper sketches and examples.

1. (a) Explain the cellular concept and derive the relationship between cluster size and co-channel reuse ratio. (b) Illustrate with an example for $N = 7$. (10 Marks)
2. (a) Derive the Friis transmission equation. (b) Discuss how this equation is modified for multipath environments. (10 Marks)
3. (a) Describe frequency-hopping spread spectrum (FHSS). (b) Compare FHSS with direct-sequence spread spectrum (DSSS). (8 Marks)
4. (a) Explain the architecture of LTE. (b) Discuss its improvements over 3G in terms of latency and data rates. (10 Marks)
5. (a) What are multiple access techniques in wireless networks? (b) Discuss OFDMA with a neat block diagram. (9 Marks)
6. Write short notes on any two: (i) Cognitive radio networks (ii) Mobile ad hoc networks (MANETs) (iii) WLAN security protocols (8 Marks)