

2125
M. E. (Information Technology)
First Semester
MEIT-1204: Advanced Wireless Technologies

Time allowed: 3 Hours

Max. Marks: 50

NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Part.

x-x-x

Q1

- (a) What is the primary technical challenge associated with the deployment and reliable operation of 5G services in the millimeter Wave frequency bands?
- (b) Explain how SSMA techniques provide inherent protection against intentional jamming.
- (c) Explain briefly the security challenge in IOT.
- (d) Discuss briefly about the security aspects of CDMA.
- (e) What are the specifications of Bluetooth in advanced wireless technologies? (5 x 2)

Part A

Q2 Discuss how the evolution of various wireless communication systems from 2G to 5G takes place? Focusing on the aspects in network architecture, data transmission technologies, and service capabilities. (10)

Q3 (a) Calculate the minimum required frequency reuse ratio so as to meet the Carrier-to-Interference Ratio requirement. What is the immediate impact of cell splitting on overall Carrier-to-Interference Ratio?

(b) Explain the cellular concept in mobile communication and illustrate with necessary expressions how the frequency reuse helps in increasing its capacity?

(2 x 5)

Q4 (a) Draw a well labeled System Architecture of GSM and explain the function and interfaces between Network Subsystem (NSS), Base Station Subsystem (BSS), and Mobile Station (MS).

(b) How does CDMA's inherent use of spread spectrum and pseudo-noise (PN) sequences contribute to its security features particularly with comparison to GSM? (2 x 5)

Part B

Q5 Explain the major factors that limit capacity in each system of the techniques TDMA and SDMA. How the available radio resources play vital role in these technologies? (10)

Q6 Explain the role of WiFi and WiMax advanced wireless technologies. How these are different in terms of features, specification and applications from Zigbee. (10)

Q7 (a) What are cognitive radio networks? Explain core problem of spectrum underutilization that Cognitive Radio Networks aim to solve.

(b) How the energy efficiency in Wireless Sensor Networks takes place? Explain routing and localization challenges in Wireless Sensor Networks. (2 x 5)

x-x-x