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Sr. No 011701

December 2023

B.Tech (IT) B.Tech. - VII SEMESTER

Wireless Communications and Ad hoc Networks(PEC-IT-I-701)

Time: 3 Hours

Max. Marks:75

- Instructions:**
1. It is compulsory to answer all the questions (1.5 marks each) of Part -A in short.
 2. Answer any four questions from Part -B in detail.
 3. Different sub-parts of a question are to be attempted adjacent to each other.

PART -A

- Q1 (a) Why wireless sensor networks need localization protocols? (1.5)
(b) Outline the hidden vs. exposed terminal problem in ad hoc networks. (1.5)
(c) State any two applications of ad hoc networks. (1.5)
(d) In WSN, the data is flooded in the network. Which IP address is used for flooding? (1.5)
(e) List the major advantages of wireless communication. (1.5)
(f) How is frequency reuse distance measured in cellular systems. (1.5)
(g) State reason why cellular concept is used for mobile telephony. (1.5)
(h) Distinguish between Hard QoS versus soft QoS approach (1.5)
(i) Define Grade of Service. (1.5)
(j) Why do paging systems need to provide low data rates? (1.5)

PART -B

- Q2 (a) Explain and Illustrate using timing diagram how a call to mobile user initiated by a landline subscriber is established. (10)
(b) Compare and contrast various channel assignment strategies (5)
- Q3 (a) Discuss the implementation of Hand off in a cellular system. Also explain different types of hand offs (10)
(b) How can capacity of cellular communication system be improved. Discuss any two capacity enhancement schemes. (5)
- Q4 Classify routing protocols for ad hoc wireless networks and present an outline of the same. Discuss issues in designing a routing protocol for ad hoc wireless networks. (15)
- Q5 Illustrate the route establishment in Ad hoc On Demand Distance Vector Routing protocol with its advantages and disadvantages (15)
- Q6 (a) Explain various Interferences in Mobile Communication and how they can be minimized. (10)
(b) If a total of 33 MHz of bandwidth is allocated to a particular FDD cellular (5)

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telephone system which uses two 25 kHz simplex channels to provide full duplex voice and control channels. Compute the number of channels available per cell, if the system uses seven cell reuse. If 1 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for the given system.

Q7 Discuss the limitations of the IEEE 802.11 MAC protocol that prevent it from supporting QoS traffic (15)

PART-A

- (1.2) (a) Why wireless sensor networks need localization protocols?
- (1.2) (b) Outline the hidden vs. exposed terminal problem in ad hoc networks.
- (1.2) (c) State any two applications of ad hoc networks.
- (1.2) (d) In WSN, the data is flooded in the network. Which IP address is used for flooding?
- (1.2) (e) List the major advantages of wireless communication.
- (1.2) (f) How is frequency reuse distance measured in cellular systems?
- (1.2) (g) State reason why cellular concept is used for mobile telephony.
- (1.2) (h) Distinguish between Hand Off versus soft QoS approach.
- (1.2) (i) Define Grade of Service.
- (1.2) (j) Why do paging systems need to provide low data rates?

PART-B

- (10) (a) Explain and illustrate using timing diagram how a call to mobile user initiated by landline subscriber is established.
- (2) (b) Compare and contrast various channel assignment strategies.
- (10) (a) Discuss the implementation of Hand off in a cellular system. Also explain different types of hand offs.
- (2) (b) How can capacity of cellular communication system be improved. Discuss any two capacity enhancement schemes.
- (12) (a) Classify routing protocols for ad hoc wireless networks and present an outline of the same. Discuss issues in designing a routing protocol for ad hoc wireless networks.
- (12) (a) Illustrate the route establishment in Ad-hoc On Demand Distance Vector Routing protocol with its advantages and disadvantages.
- (10) (a) Explain various interferences in Mobile Communication and how they can be minimized.
- (2) (b) If a total of 33 MHz of bandwidth is allocated to a particular FD cellular

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