Indian Institute of Technology Patna
Date: 22 Feb 2025
MIDSEM: CS 548/CS6206: Wireless Networks

DURATION: 2 HOURS. 430-630PM

Full Marks 80

Instruction: All questions are compulsory. No Free hand diagrams allowed. If free hand diagrams are seen, you will be penalized 50% of marks. No doubts would be entertained. Write suitable assumptions, if necessary. Students are allowed to use scientific calculators. Each question from Q1 should start on a fresh page. So if the Q1 takes 1/2 page to finish, begin Q2 from the next page. **If two questions are written on the same page, both will be marked 0.**

Q(1) Explain the complete 802.11 MAC frame format using a schematic diagram. Explain each part for the frame briefly. (No Free hand diagrams allowed.)
[Marks 20]

Q(2) Explain in details the CSMA/CA protocol for wireless networks using a timeline diagram. Why cant CSMA/CD protocol be used in wireless networks?. Write the full forms for CSMA/CA and CSMA/CD. (No Free hand diagrams allowed.)
[Marks 10]

Q(3) Draw a schematic diagram for Basic service sets (BSSs) in adhoc mode and Basic service sets (BSSs) in infrastructure mode. Provide briefly the basic differences between the two. (No Free hand diagrams allowed.)
[Marks 10]

Q(4) Describe the hidden terminal problem in Wireless networks using a schematic diagram. What is the solution for the same. Explain the solution using a schematic diagram. (No Free hand diagrams allowed.)
[Marks 10]

Q(5) Describe the MAC Address Filtering provided in WiFi router settings. What are the blacklist and whitelist MAC address and the associated setting?
[Marks 5]

Q(6) Why is 802.11 Wireless Networks vulnerable to Deauthentication Attack. Provide a schematic diagram and stepwise process how an attacker can easily launch a Deauthentication Attack in wireless networks. (No Free hand diagrams allowed.)
[Marks 5]

Q(7) In an 802.11 network, if the DIFS duration is 50 μs and the slot time is 15 μs, how long is the SIFS? Explain with formula.
[Marks 5]

Q(8) Difference between Open System Authentication and Shared Key Authentication.
[Marks 5]

Q(9) You are asked to make a campus wide WiFi network setup for IITP campus. Describe your design and things that you will take into consideration. This is an open ended question. Describe the features that you will use with justification. You can detail as much as possible.
[Marks 10]