M. Tech. Computer Technology Second Year First Semester Examination 2024

Wireless Communication & Protocols

Time: 3 hours Full Marks: 100

Answer ANY FOUR (4) questions
(All parts of the same question must be answered together)

1. [(6+8)+(3+3)+5=25]

a. What are the principal challenges that the designers of mobile computing system have to deal with? Mention possible solutions for the challenges of different category.

b. What should be the characteristics of MANET routing protocols? Give an example of each category of MANET routing protocols.

c. Show how frequency can be reused using seven (7) frequencies allocations in a cellular network.

2. [(10+5)+6+4=25]

a. (i) Consider Figure 1. Find route/s between B and G using Destination Sequenced Distance Vector (DSDV) routing protocol. Explain the working of DSDV as you find the route/s.

(ii) How does the working of Adhoc On demand Distance Vector (AODV) routing protocol differ from DSDV protocol?

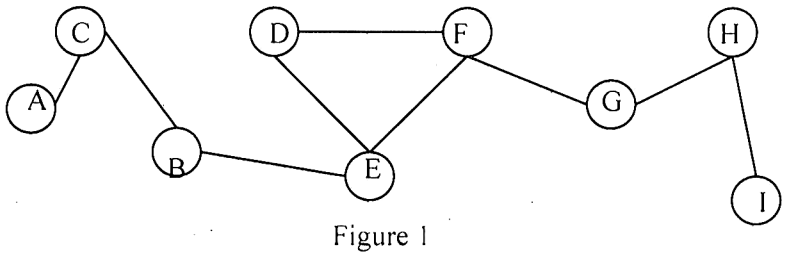

Figure 1

b. Identify any two clusters with respective Clusterheads and Gateway/s in Figure 1. Justify your answer.

c. Which MANET routing protocol uses source routing? What are its advantages?

3. [(3+4+2)+(2+2+3)+3+6=25]

a. What are the *subsystems* of GSM? What are their functionalities? State the components of any one *subsystem.*

b. What does the Subscriber Identity Module (SIM) contain? Does a mobile phone work even if SIM is moved from one device to the other? Justify your answer. How is a mobile subscriber identified in GSM?

c. How does TDMA/FDMA work in GSM?

d. How does a Mobile Originated Call work?

4. [(2+4+2)+(3+3+4)+7=25]

a. What is the IEEE standard for Wireless Local Area Network (WLAN)? Name the layers and show how the layers are organized. What are the Spread Spectrum radios based on?

b. What are the functionalities of Medium Access Control (MAC) layer? What are the challenges? What are the MAC mechanisms?

c. What are the different tasks of the MAC Management layer? Explain the Power management as done in MAC layer.

5. [(2+2+2+3)+(4+1)+(4+3)+4=25]

a. What are the usage models of Bluetooth? What is a piconet? What types of links can be established in piconet? How does access take place in piconet?

b. What happens during the Inquiry procedure? Which *access code* is used then?

c. What are the states/modes in which a slave node can be connected? Choose any mode and state how can a device operate in that mode?

d. What does the Link Manager Protocol (LMP) do?

6. [5+(4+3+4+1)+4+4=25]

a. What are the requirements of Mobile IP?

b. What are *Care of Address* (CoA), *Correspondent Node* (CN)? How does registration take place when a mobile node (MN) is in foreign network? What happens if the MN migrates to another foreign network after the first foreign network? What type of *handover* occurs then?

c. What is *reverse tunneling*? Is it not advantageous? Why or why not?

d. What does an agent advertise and why? What can MN understand from these advertisements?