Q.1  
a. Define routing and localization in wireless systems.

b. Distinguish between SDMA and FDMA.

c. Draw the architecture of Wireless LAN and mention any two advantages of WLAN.

d. Mention applications of Bluetooth.

e. Explain authentication in mobile applications.

f. Define Sectoring and explain how it helps in decreasing the co-channel Interference.

g. Compare Active RFID and Passive RFID.  

Q.2  
a. Compare characteristic features of CDMA and GSM.

b. Define frequency reuse. If a total of 50 MHz bandwidth is allocated to a particular cellular system which uses two 40 KHz simplex channels to provide full duplex voice and control channels. Compute the number of channels available per cell if a system uses:
   (i) Four-cell reuse
   (ii) Seven-cell reuse

   c. Explain co-channel interference. Give equations for co-channel reuse ratio, signal-to-interference ratio for mobile receiver and average received power at distance d.

Q.3  
a. Explain features of various components in Bluetooth Protocol stack.

b. Give the working of Mobile IP. Explain features of discovery, registration and tunneling features of Mobile IP.
c. Explain address space and packet payload for IPv6. (6)

Q.4 a. Draw the architecture of cellular mobile communication and explain its working mechanism. (6)

b. Explain the functionality of AUC, HLR, VLR and EIR. (6)

c. Explain various types of handoff and channel allocation techniques. (6)

Q.5 a. Explain the multi-path signal propagation and effecting factors. (6)

b. Assume a receiver is located 10KM from a 50 W transmitter. The carrier frequency is 6 GHz and free space propagation is assumed $G_t = 1$ and $G_r = 1$.
   (i) Find the power at the receiver.
   (ii) Find the magnitude of the E-Field at the receiver antenna. (6)

c. Explain the following with reference to Medium Access Control:
   (i) Hidden and exposed terminals
   (ii) Near and far terminals (6)

Q.6 a. Explain Mobile TCP. Give its advantages and disadvantages. (6)

b. Explain broadcast models in wireless information networks. (6)

c. Explain how transactions in mobile computing environment differ from centralized or distributed data bases. (6)

Q.7 a. Compare the characteristic features of wearable computing and pervasive computing. (6)

b. Mention attacks that are vulnerable in a non-secure mobile environment. (6)

c. Write a short note on any TWO of the following:
   (i) Mobile Agents Security
   (ii) Power management in mobile computing
   (iii) Location aware services (2×3)