Q.1  
   a. What is the relationship between a base station and a mobile switching center?  
   b. What is the maximum number of callers in each cell in a GSM?  
   c. Explain briefly the functions of Host Controller Interface (HCI) and Service Discovery Protocol (SDP).  
   d. What is Hidden Terminal and Exposed Terminal problem? Explain.  
   e. Mention atleast four limitations/challenges that wireless LAN technology needs to overcome.  
   f. Differentiate between adjacent channel and co-channel interference.  
   g. What is objective of WEP? How it is achieved?  

Q.2  
   a. Explain the term interference and countermeasures in SDMA, TDMA, FDMA and CDMA systems.  
   b. Discuss various identifiers/addresses-IMEI, IMSI, MSISDN, MSRN, LAI, TMSI, LMSI, CI and BSIC- provided in GSM. Distinguish between user related and system related identifiers.  

Q.3  
   a. Describe Bluetooth architecture and protocol. Also discuss its limitations.  
   b. What are the several requirements that accompanied the development of the mobile IP as a standard to enable mobility in the internet?  

Q.4  
   a. How is handoffs in cellular mobile communication affected by handoff threshold and minimum acceptable signal level? Illustrate Hard Handoff and Soft Handoff in cellular mobile communication systems.
b. What do you mean by the following terms: AUC, HLR, VLR, and EIR? Explain briefly. (8)

c. Looking at the HLR/VLR database approach used in GSM—how does this architecture limit the scalability in terms of users, especially moving users? (4)

Q.5 a. What are the different types of Inter Frame Space (IFS) used by IEEE 802.11 protocol? Explain their purpose. (4)

b. Explain in brief the Frequency Hopping Spread Spectrum (FHSS) technique. (4)

c. Most wired LANs products use Carrier Sense Multiple Access with Collision Detection (CSMA/CD) as the MAC protocol. However wireless topologies can create a problem for CSMA/CD. What challenges must be dealt with by the MAC used for IEEE 802.11? Discuss main steps of the solution to these problems. (10)

Q.6 a. Give an overview of mechanism, advantages and disadvantages of following classical enhancements to TCP for mobility: (12)

(i) Indirect TCP
(ii) Snooping TCP
(iii) M-TCP
(iv) Fast retransmit /fast recovery

b. Discuss two basic transport mechanisms used by Digital Audio Broadcasting (DAB). (6)

Q.7 a. What are the functions of authentication and encryption in GSM? How is system security maintained? (4)

b. Discuss three different forms of human-computer interaction: active, passive and coercive with respect to pervasive computing. (6)

c. Discuss working of Mobile agent. For what types of applications mobile agents are suitable? (8)