

(3 Hours)

[Total Marks: 80]

NB: (1) Question no 1 is compulsory.

- (2) Solve any three from remaining five.
- (3) Draw neat diagrams wherever required.
- (4) Assume suitable data if required.

1. (a) What are the components of sensor nodes? 20
- (b) Explain CSMA/CA technique
- (c) Explain the concept of trusted device with reference to Bluetooth
- (d) Discuss two evolution paths for the GSM to offer 3G services.

2. (a) Using the following data for a GSM network, estimate the voice and data traffic 10
per subscriber. If there are 40 BTS sites, calculate voice and data traffic per cell.
 Subscriber usage per month: 150 minutes
 Days per month: 24
 Busy hours per day: 6
 Allocated spectrum: 4.8 MHz
 Frequency reuse plan: 4/12
 RF channel width: 200 kHz (full rate)
 Present number of subscribers in a zone: 50,000
 Subscriber growth per year: 5%
 Network roll-over period: 4 years
 Number of packet calls per session (NPCS): 5 (see Figure)
 Number of packets within a packet call (NPP): 25
 Reading time between packet calls (T_r): 120 s
 Packet size (NBP): 480 bytes
 Time interval between two packets inside a packet call (T_{int}): 0.01 s
 Total packet service holding time during one hour (T_{tot}): 3000 s
 Busy hour packet sessions per subscriber: 0.15
 Penetration of data subscribers: 25%
 Data rate of each subscriber: 48 kbps
 Packet transmission time: 10 s

Turn Over

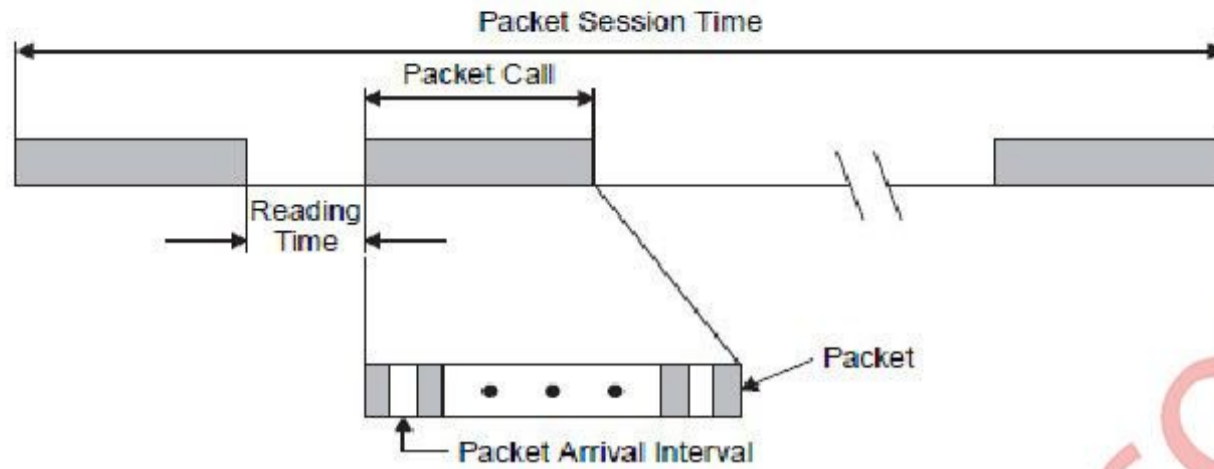


Fig: Packet session

- (b) Explain the ZigBee technology. Discuss different network topologies that are supported in ZigBee. 10
3. (a) Discuss WiMAX in detail and compare its performance with Wi-fi 10
- (b) Explain link budget analysis and requirements of wireless Network 10
4. (a) Explain transmit diversity present in forward link of Cdma 2000 10
- (b) What are sensor network management design issues? Elaborate any one with example 10
5. (a) Explain Bluetooth security features and Give its protocol architecture 10
- (b) Draw the neat block diagram of UMTS architecture Explain all interfaces. 10
6. Write short note on 20
- (a) HSDPA
- (b) RFID