12/5/17

(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 (Tr): 120 s

Packet size (NBP): 480 bytes

Time interval between two packets inside a packet call (Tint): 0.01 s

Total packet service holding time during one hour (Ttot): 3000 s

Busy hour packet sessions per subscriber: 0.15

Penetration of data subscribers: 25%

Data rate of each subscriber: 48 kbps
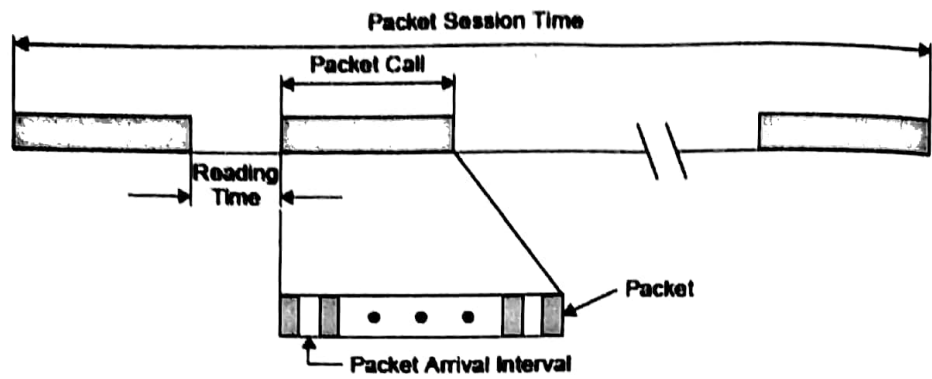
Packet transmission time: 10 s

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