E+TC/VIII/CBC

8/5/2019

Paper / Subject Code: 52901 / Wireless Networks

(3 Hours) [Total Marks - 80]

N. B.(1) Question 1 is compulsory

(2) Solve any three from remaining five.

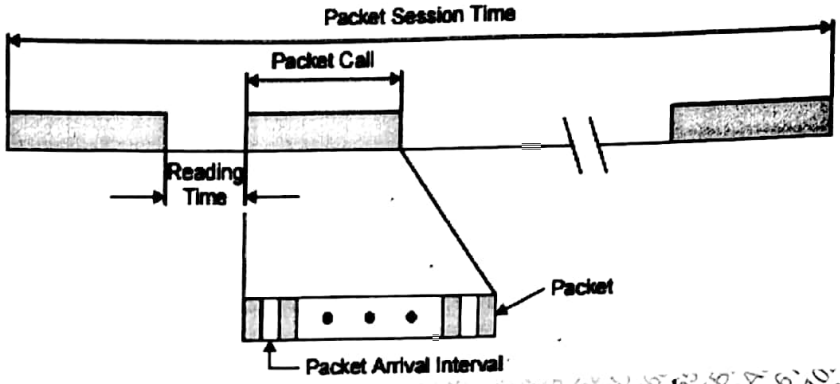
(3) Draw neat sketches wherever require.

(4) Assume suitable data if required.

1. **Solve any four**
   (a) Give the features of LTE 5
   (b) Explain various states in Bluetooth system 5
   (c) What are the three phases of wireless network design? Explain 5
   (d) What are the basic middleware functions for WSN? Explain. 5
   (e) What is RFID? Discuss different components of RFID and explain how the communication takes place among the components? 5

2. (a) Using the following data for a GSM network, estimate the voice and data traffic per subscriber. If there are 40 BTS sites, calculate voice and data traffic per cell. 10
   - Subscriber usage per month: 150 minutes
   - Days per month: 24
   - Busy hours per day: 6
   - Allocated spectrum: 4.8MHz
   - Frequency reuse plan: 4/12
   - RF channel width: 200 kHz(full rate)
   - Present no. of subscriber in the zone: 50,000
   - Subscriber growth per year: 5%
   - Network roll out period: 4 years
   - Number of packet calls per session (NPCS): 5
   - Number of packets within a packet call (NPP): 25
   - Reading time between packet calls ($T_r$): 120s
   - Packet size (NBP): 480 bytes
   - Time interval between two packets inside a packet call ($T_{int}$): 0.01s
   - Total packet service holding time during one hour ($T_{tot}$): 3000s
   - 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




(b) Explain link budget analysis requirement of wireless network. 10

3. (a) Give detailed radio access network overview. Explain in detail functions of Node B and RNC also draw UTRAN logical architecture. 10
   (b) Explain HSDPA emphasizing its primary objectives and how it achieves performance improvement? 10

4. (a) Explain the ZigBee technology. Discuss different network topologies that are supported in ZigBee. 10
   (b) Explain Bluetooth security features and security levels with proper diagram. 10

5. (a) Why TCP and UDP protocols are unsuitable for implementation in WSN? List out transport protocols designed for WSN. Explain any one in detail. 10
   (b) Describe the model of Wireless Sensor Network. What are the factors influencing design of wireless sensor network 10

6. Write short note on **(any two)** 20
   (a) IEEE 802.16
   (b) Middleware architecture of WSN
   (c) UWB technology