## CE2-R3: WIRELESS AND MOBILE NETWORKS

**NOTE:**

> 1.  **Answer question 1 and any FOUR from questions 2 to 7.**
> 2.  **Parts of the same question should be answered together and in the same sequence.**

**Time: 3 Hours**                                                               **Total Marks: 100**

**1.**
a)  Explain different layers of Bluetooth protocol stack.
b)  How are the signals modulated and transmitted in UWB?
c)  How is IS-136 standard well suited for wireless PBX applications?
d)  Write the reasons to use a hierarchical cellular infrastructure that supports cells of different sizes. Describe the way to divide cells into different sizes.
e)  Write and interpret expressions for Coherent Bandwidth and Coherent Time.
f)  Explain the uses of various interframe spaces in IEEE 802.11 LANs.
g)  Write the fundamental characteristics and application example of UMTS QoS (Quality of Service) classes.

**(7x4)**

**2.**
a)  In a mobile communication system, transmit and receive antenna heights are 50m and 1.5 m above ground respectively. The gains of transmit and receive antennas are 3db and 2.55db respectively. The antennas are spaced 5km away. Compute the received power using 2-ray ground reflection model.
b)  Describe the methods to expand the capacity of a cellular network.

**(10+8)**

**3.**
a)  Describe various methods for channel allocation in wireless communication.
b)  What is hidden terminal problem in WLANs? How is this problem solved?
c)  Explain GSM System Architecture. The security methods standardized for the GSM System make it the most secure cellular telecommunications standard currently available. Explain the security measures which can be implemented for the user.

**(6+5+7)**

**4.**
a)  Describe the characteristics of infrared-based connections. Write the Comparison of Radio Frequency and Infrared Communication.
b)  Compare LEO and GEO satellite communication systems from quality of service point of view.
c)  Explain the requirement of Wireless LAN design.

**(6+6+6)**

**5.**
a)  Why is standard TCP not suitable for wireless data transfer? How do Snoop and Split-TCP modify TCP for wireless networks?
b)  What are the salient features of GPRS? Give comparison between GPRS and GPS in terms of data rate, modulation techniques, billing and type of connection.

**(9+9)**

**6.**
a) How is PCF used in WLANs?
b) Explain MAC frame structure for 801.11 protocol family.
c) Describe various types of handoff in satellite systems. List parameters used to determine the received power.

**(5+8+5)**

**7.**
a) How does GPS Work? Explain the factors that can cause positional errors that affect GPS accuracy?
b) "Multimedia services can reliably use wireless ATM." Comment.
c) Explain QPSK modulation by using its constellation diagram

**(6+6+6)**