CE2-R3: WIRELESS AND MOBILE NETWORKS

NOTE:

1.	**Answer question 1 and any FOUR questions from 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) Why do paging systems need to provide low data rates? How does a low data rate lead to better coverage?
b) Discuss the similarities and differences between a conventional cellular radio system and a space based (satellite) cellular radio system.
c) Explain the concept of coherence bandwidth.
d) Explain cell sectoring and cell splitting with its advantage.
e) Why are Wireless Local Loops (WLLs) effective in communications?
f) Explain the process of registration of a mobile station in satellite networks.
g) What is UWB (Ultra Wide Band)? Explain various applications of it.

(7x4)

2.

a) How is hidden node problem solved in WLANs?
b) Explain data exchange and backoff procedures in IEEE 802.11 protocol. Use appropriate diagrams.
c) Classify routing procedures in WLANs.

(6+9+3)

3.

a) Explain the inefficiencies of mobile IP regarding data forwarding from a corresponding node to a mobile node. What are the optimizations and what additional problems do they cause?
b) Why is TCP not useful in mobile networks? Give reasons.

(9+9)

4.

a) What is Frequench-Hopping Spread Spectrum (FHSS) in wireless local area network? What are the advantages offered by spread spectrum transmission over fixed frequency transmission?
b) Explain QPSK using transmitter and receiver Block diagram. Compare its features with BPSK.

(8+10)

5.

a) Explain protocol model and typical call flow sequence in IS-136: North American TDMA standard.
b) What is the motivation to implement Wireless ATM (WATM)? Describe the WATM architecture.
c) Briefly explain the main layers of Bluetooth protocol stack. Also clearly mention the developing advantage of Bluetooth protocol.

(5+7+6)

6.

a) How can higher data rates be achieved in standard GSM, how is this possible with the additional GPRS, EDGE? What are the main differences of the approaches, also in terms of complexity? What problems remain even if the data rate is increased?

b) Explain static and dynamic channel allocation (assignment) methods. Compare their effectiveness in cellular systems.

(10+8)

7.

a) Name the main elements of the GSM system architecture and describe their functions.

b) What are the main benefits of a spread spectrum system? How can spreading be achieved?

c) What is Co-channel Interface (CCI) in GSM? Obtain an expression for Signal to Interference Ratio (SIR) when the interference is CCI.

(5+5+8)