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) If a complete coverage area was redesigned using larger cluster sizes, what will most likely be the effect on adjacent channel interference? Why?

b) What is difference between co-channel and adjacent channel interference? Give two methods to reduce these interferences.

c) Give the expression for path loss. Differentiate between slow fading and fast fading.

d) Draw and explain the operation of QPSK transmitter. Give its truth table and constellation diagram.

e) Explain the terms and the functions of WANU and WASU as used in the TR-45 architectural reference model of WLL.

f) Explain the MACA protocol and tell how hidden terminal and exposed terminal problem can be solved. How is MACA different from MACAW?

g) Compare and contrast different satellite configurations. Which one is most suitable for satellite based cellular mobile operations.

(7x4)

2.

a) Explain the concept of frequency reuse. Define and deduce co-channel interference reduction factor. Find its value for k=7.

b) Define the TDMA, FDMA and CDMA. Why is CDMA the most sought after multiple access technique in 3G?

c) Prove that $N= i^2 + g^2 + ij$ & $D= R\sqrt{3N}$.

(8+6+4)

3.

a) Deduce the relationship of received power (Pr) at a distance (d) in a wireless communication system using two-ray model.

b) Discuss different fixed channel assignment Strategies. What are its limitations as compared to non-fixed channel assignment methods?

c) What is cell splitting?

(8+8+2)

4.

a) Draw the basic reference architecture and signaling interfaces for GSM. Why is Smart card needed in GSM, while it is not required in AMPS?

b) How do you compare D-AMPS and GSM systems in terms of coverage area, transmitted power and error control system? Explain, what you can do to address adjacent channel and co-channel interference.

c) Advantages of digital cellular systems over analog.

(8+8+2)

5.

a) Describe the GPRS architecture and its protocols.

b) Compare GPRS with CDPD. What are the fundamental differences between the two services and what are the guidelines shared by them.

c) What are enhanced features in EDGE, which are not present in GPRS.

(6+6+6)

6.

a) With the help of a neat block diagram explain TR-45 Wireless Local Loop Reference model?

b) Describe the WLL OAM Management functions.

c) Discuss the characteristics of UWB system. Also draw the advantages and limitations of UWB technology.

(6+6+6)

7.

a) Describe the Circuit switched Data on Digital cellular networks. Clearly explain the terms TRAU and IWF used to support GSM in data transport.

b) What is GMPCS? Explain what are GEO, MEO and LEO systems. Give the call flow diagram for an ISU and ISU call in iridium system.

c) Write a note on the Wireless Local loop technologies. Describe cellular based systems in detail.

(6+6+6)